

# 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:

**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)

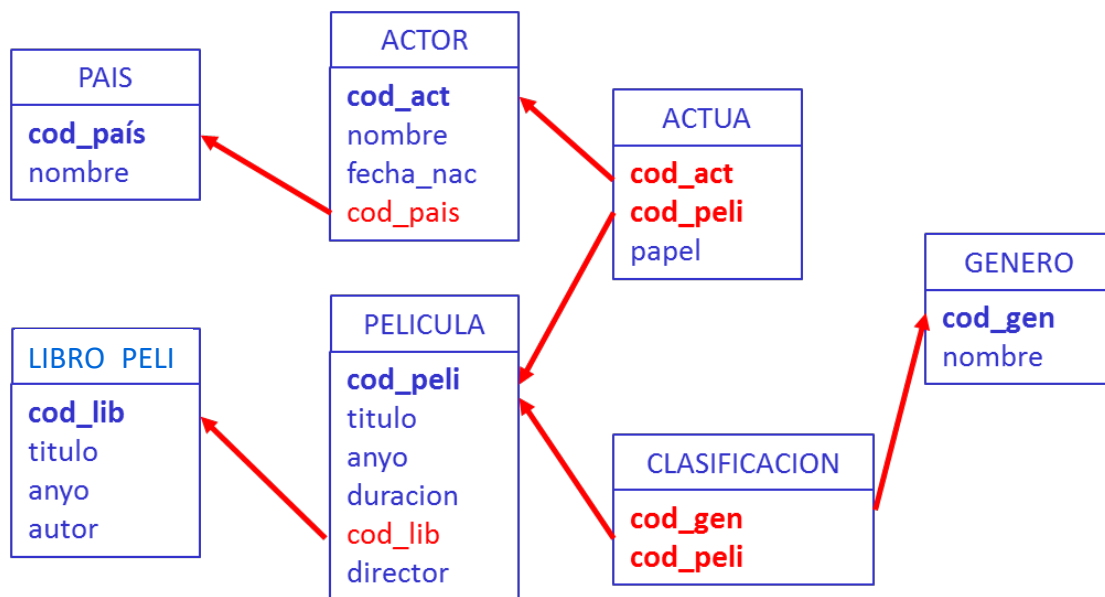
**CLASIFICACION** (cod\_gen:char(5), cod\_peli:char(5))  
PK:{cod\_gen, cod\_peli}  
FK:{cod\_peli} → Pelicula(cod\_peli)  
FK:{cod\_gen} → Genero(cod\_gen)

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. Obtain 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. Obtain 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. Obtain the code and name of the actors which name includes "John".

```

COD_A NOMBRE
-----
A62 John Goodman

```

4. Obtain 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. Obtain 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. Obtain 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. Obtain 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 picapietra
789B The mexican
8 filas seleccionadas
```

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

```
ANYO
-----
2001
```

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

```
COD_A NOMBRE
-----
K58 Stanley Holloway
```

24. Obtain 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. Obtain the genre (or genres) of the longest movie.

```
NOMBRE
-----
Bélica
Drama
Romance
```

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

TITULO

-----  
 Lo que el viento se llevó

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

COUNT (\*)

-----  
 68

29. Obtain 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. Obtain the year (or years) in which were born more than 3 actors.

AÑO

-----  
 1954  
 1940

31. Obtain 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. Obtain de 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain the directors who have directed two (exactly 2) movies whose name contains the string 'George'.

```

DIRECTOR
-----

```

```

George Roy Hill
George Clooney

```

43. Obtain 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. Obtain 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. Obtain the code (or codes) and the genre (or genres) with most movies.

```

COD_G NOMBRE
-----
BB5 Drama

```

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

```

COD_P  NOMBRE
-----
sf15   USA

```

48. Obtain 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 but using GROUP BY.

### 3.6 Queries with different joins

50. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain the name of the genre (or genres) of the longest movie.

COD\_G NOMBRE

```
-----
BB5   Drama
HH2   Romance
OI9   Bélica
```

56. Obtain, 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

57. Obtain the code and name of "actors" who have only acted in films released after 1994.

COD\_A NOMBRE

```
-----
K77   Cameron Diaz
D52   Cate Blanchett
J58   Ed Harris
F55   George Clooney
A52   Jude Law
K78   Kate Winslet
H54   Keira Knightley
S65   Kevin Bacon
C52   Matt Damon
A47   Robert Downey Jr.
P14   Sean Penn
11 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.

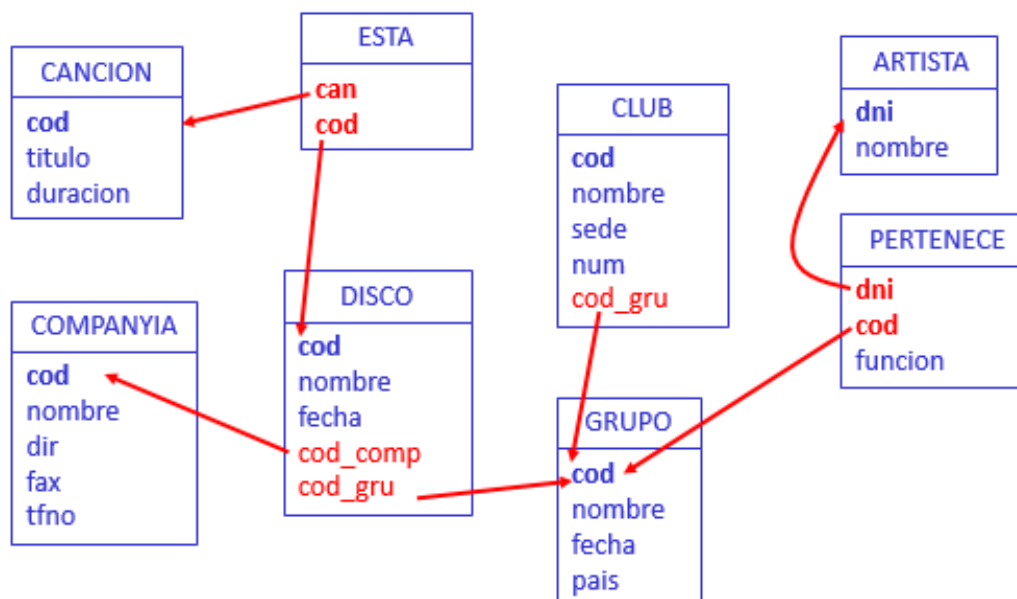
*num*: number of members of the club.

*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

- 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. Obtain the different functions that can be performed in a group.

FUNCION

```
-----
bajo
batería
guitarra
teclado
voz
5 filas seleccionadas.
```

## 5. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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
7 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. Obtain the name of the record companies that have not worked with Spanish groups.



NOMBRE

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

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

NOMBRE

-----  
 ARIOLA  
 WEA  
 2 filas seleccionadas.

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

NOMBRE

DIR

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. Obtain the names of the Spanish groups and the total amount of their fans.

NOMBRE

FANS

NOMBRE	FANS
-----	-----
Presuntos Implicados	617
Radio Futura	10207
2 filas seleccionadas.	

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

NOMBRE

NUMERO

NOMBRE	NUMERO
-----	-----
Genesis	3
Mike + The Mechanics	4
Presuntos Implicados	3
Radio Futura	4
U2	4
5 filas seleccionadas.	

22. Obtain the number of records of each group.

NOMBRE

DISCOS

NOMBRE	DISCOS
-----	-----
U2	4
Simple Minds	4
Mike + The Mechanics	2
Genesis	3

```

Presuntos Implicados      3
Radio Futura              2
6 filas seleccionadas.

```

23. Obtain 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. Obtain 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. Obtain 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	GUIARRA
Soledad Giménez	Enrique Sierra
Santiago Auseron	J.L. Giménez

2 filas seleccionadas.

27. Obtain 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. Obtain 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:

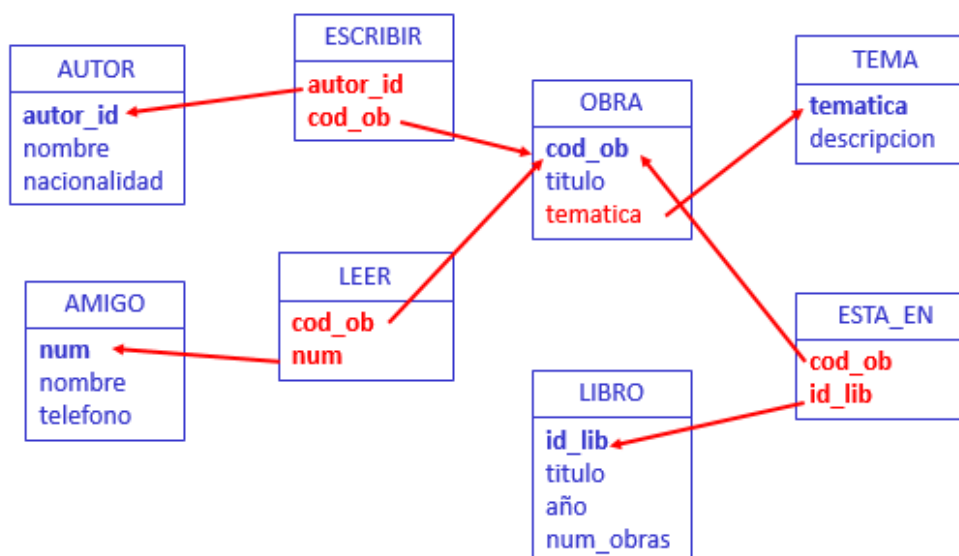
- The value of the attribute *num\_obras* in the “libro” relation must be equal to the number of tuples in “Esta\_en” for the book.
- Every book contains at least one work.
- If a book has a title and it only contains one work, the title of the book matches the title of the work.

### 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. Obtain the name of the authors from 'Argentina'.

NOMBRE

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

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

TITULO

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

3. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain the name of the authors counted in the previous query.

NOMBRE

```
-----
Peris Rossi, Cristina
Apollinaire, Guillaume
García Hortelano, Juan
3 filas seleccionadas.
```

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

NOMBRE

```

-----
18 filas seleccionadas.

```

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

NOMBRE

```

-----
Valera, Juan
1 fila seleccionada.

```

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

NOMBRE

```

-----
Isabel Peiró García
1 fila seleccionada.

```

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

```

No se ha seleccionado ninguna fila

```

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

NOMBRE

```

-----
Pepe Pérez Pérez

```

1 filas seleccionadas.

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

No se ha seleccionado ninguna fila

26. Obtain the name of the friends who have only read works written by one author (all the read books are written by the same 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain, 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. Obtain the name of the author (or authors) who has written the most works.

NOMBRE

-----  
Pla, Josep  
1 fila seleccionada.

**34. Obtain the less used nationality.**

NACIONALIDAD

-----  
Alemana  
Checa  
Colombiana  
Danesa  
Griega  
Mejicana  
6 filas seleccionadas.

**35. Obtain 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. Obtain 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, obtain all the book titles stored in the database independently of the number of works that they have.

TITULO

-----  
...  
301 filas seleccionadas.

**38. Obtain 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. Obtain 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. Obtain 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. Obtain 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.

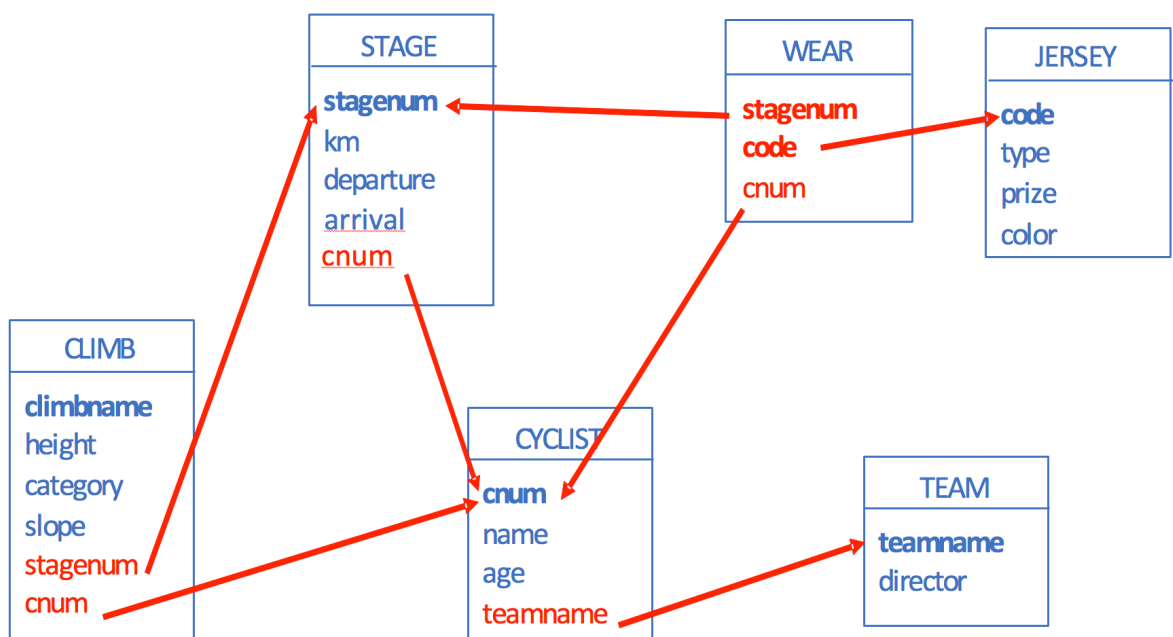
*color*: color of the jersey.

*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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain the average age of all the cyclists.

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

9. Obtain 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. Obtain 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 Navalmoral	2
Sierra Nevada	E

7 filas seleccionadas.

11. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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 Onís
20	Segovia
21	Destilerías Dyc

14 filas seleccionadas.

17. Obtain 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. Obtain the name of the departure and the arrival cities of the stages where the steepest climbs are located.

```
DEPARTURE                      ARRIVAL
-----
Igalada                        Andorra
1 fila seleccionada.
```

20. Obtain 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. Obtain the name of the youngest cyclist.

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

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

```
NAME
-----
Vladislav Bobrik
1 fila seleccionada.
```

23. Obtain 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. Obtain 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. Obtain 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	Lonrenzo Sciacchi
ONCE	Manuel Sainz
Seguros Amaya	Minguez
TVM	Steveens Henk
Wordperfect	Bill Gates

17 filas seleccionadas.

26. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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
Ionrenzo Sciacchi	Navigare
Manuel Sainz	ONCE
Moreno Argentin	Gewiss
Morgan Reikcard	Telecom

6 filas seleccionadas.

35. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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. Obtain 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.

## 10 THE DEPARTAMENTO (DEPARTMENT) DATABASE

The queries for this schema are not classified in sections and are not ordered by difficulty. The student should decide the way of solving each query.

The Department of Information Systems and Computing want to create a database to store information about its organization using the following relational schema:

**CENTRO** (ccen:char(6), nmcen:char(100))

PK: {ccen}

NNV: {nmcen}

**PROFESOR** (nip:entero, nom:char(150), ctg:char(7), ccen:char(6),  
doctor:char(1), hded:real, area:char(3), grupo\_inv:char(10))

PK: {nip}

FK: {ccen} → Centro

FK: {grupo\_inv} → Grupo\_inv(cgi)

NNV: {nom, ctg, doctor, area, hded}

**TITULACION** (ctit:char(6), nomtit:char(150))

PK: {ctit}

NNV: {nomtit}

**ASIGNATURA** (cod\_asg:entero, ccen:char(6), ctit:char(6), cu:char(2),  
nmasg:char(120), resp:entero, udo:char(3), caracter:char(2),  
gt:entero, gp:entero, ct:real, cp:real, nalm:entero, area:char(4))

PK: {cod\_asg}

FK: {ccen} → Centro

FK: {resp} → Profesorf(resp) = nip

FK: {ctit} → Titulacion

FK: {udo} → Udocente

NNV: {ccen, ctit, nmasg, udo}

**GRUPO\_INV** (cgi:char(10), nombre:char(100), responsable:entero,  
grupo\_princ:char(10))

PK: {cgi}

FK: {responsable} → Profesor(nip)

FK: {grupo\_princ} → Grupo\_inv(cgi)

NNV: {nombre, responsable}

**DOCENCIA** (cod\_asg:entero, nip:entero, gtp:real, gpp:real)

PK: {ccen, ctit, casg, nip}

FK: {ccen, ctit, casg} → Asignatura

FK: {nip} → Profesor

NNV: {gtp, gpp}

**UDOCENTE** (udo:char(3), nudoc:char(40), resp:entero)

PK: {udo}

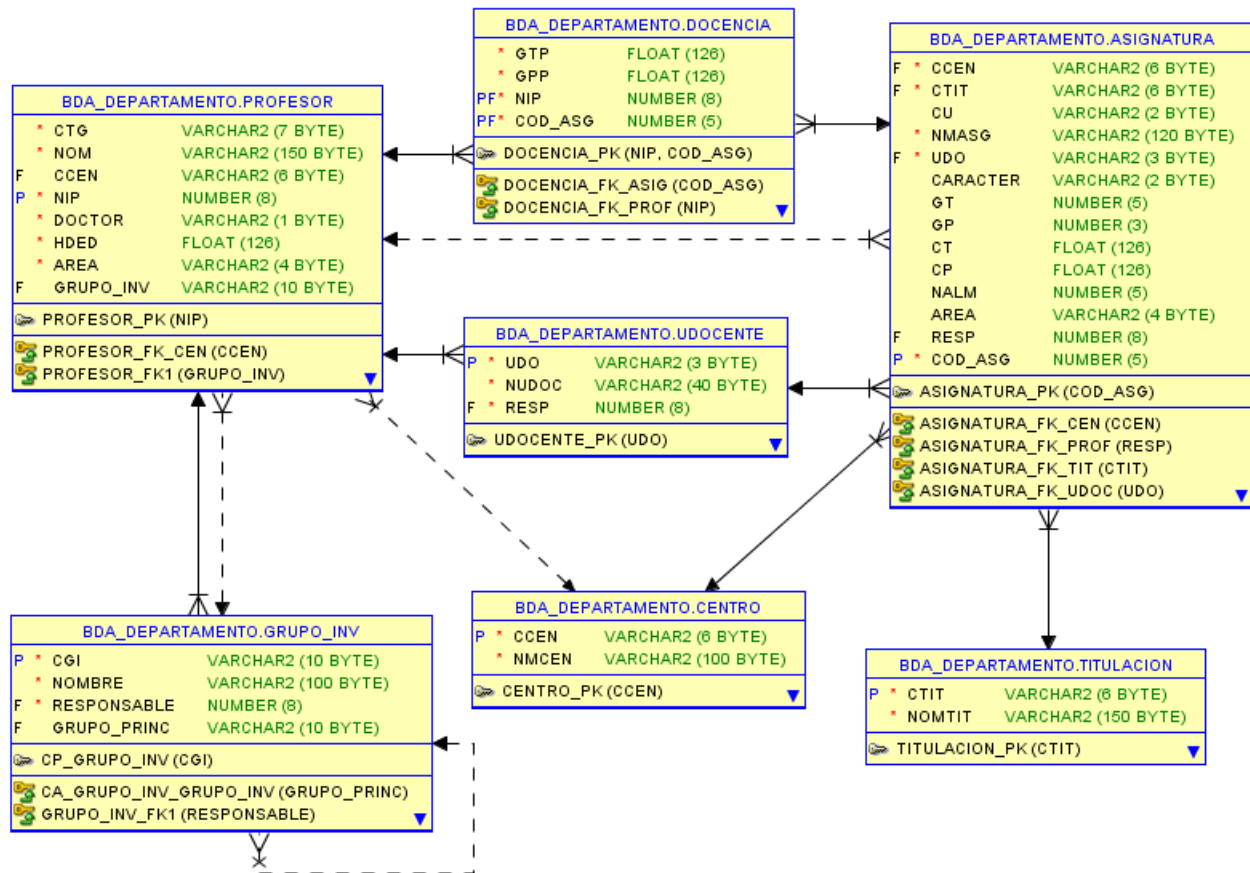
FK: {resp} → Profesor(nip)

NNV: {nudoc, resp}

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

- **Centro:** centers where the department is teaching subjects
  - *ccen*: Code of the center.
  - *nmcen*: Name of the center.
- **Titulación:** Degrees where the department is teaching some subject.
  - *ctit*: Code of the degree.
  - *nomtit*: Name of the degree.
- **Profesor:** department lecturers
  - *nip*: id of the teacher.
  - *nom*: Name.
  - *ctg*: Category.
  - *ccen*: Center where the lecturer teaches.
  - *doctor*: 'S' if the lecturer has a PhD. 'N' if not.
  - *hded*: Number of credits the lecturer has to teach.
  - *area*: Knowledge area of the lecturer.
  - *grupo\_inv*: Research group of the teacher.
- **Asignatura:** Subject.
  - *cod\_asg*: Code of the subject.
  - *ccen*: Code of the center where the subject is taught.
  - *ctit*: Code of the degree of the subject.
  - *cu*: Course and semester of the subject.
  - *nmasg*: Name of the subject.
  - *resp*: id of the responsible lecturer.
  - *udo*: Teaching area of the subject.
  - *caracter*: Type of subject. O: optional, B: compulsory, S: basic).
  - *gt*: Number of groups.
  - *gp*: Number of laboratory groups.
  - *ct*: Credits for each group.
  - *cp*: Credits for each laboratory group.
  - *nalm*: Number of students.
  - *area*: Knowledge area of the subject.
- **Grupo\_inv:** Research groups.
  - *cgi*: Code of the research group.
  - *nombre*: Name of the group.
  - *responsable*: id of the head of the group.
  - *grupo\_princ*: Main group to which this subgroup belongs.
- **Docencia:** Teaching assignation.
  - *cod\_asg*: Subject code.
  - *nip*: Lecturer code.
  - *gtp*: Number of groups of this subject that the lecturer is teaching.
  - *gpp*: Number of laboratory groups of this subject that the lecturer is teaching.
- **Udocente:** Teaching areas.
  - *udo*: Code of the teaching area.
  - *nudoc*: Name of the teaching area.
  - *resp*: id of the lecturer in charge of the teaching area..

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



This diagram is generated by the Oracle DBMS and in it:

- Each box represents a table.
- A red asterisk in front of an attribute indicates that this attribute has a **non-null** value constraint.
- The **primary key** of a relation is indicated in several ways:
  - P in front of the attributes that is part of it.
  - Using the symbol
- A **foreign key** is identified in several ways:
  - F in front of the attributes that are in the foreign key.
  - Using the symbol
  - Using an arrow connecting the table to the referenced table. The arrow is continuous if the foreign key also has a non-zero value constraint and discontinuous if it can be null.
- A **uniqueness** constraint is identified by:
  - U in front of the attributes
  - .
  - Using the symbol

## 11 DEPARTAMENTO DATABASE EXERCISES<sup>1</sup>

1. Obtain the name (*nom*) of the lecturers teaching the lowest number of credits.

NOMBRE

-----  
Donat Cano, Pino  
Yudici Cosme, Alexandro

2. How many subjects (*asignaturas*) are there that the responsible lecture does not teach that subject?

CUÁNTAS

-----  
3

3. Obtain the name of the subjects (*nmasg*) of the center of code 'R' and of the degree with code 156 which has the most students enrolled.

NMASG

-----  
Programación

4. Obtain the name of the subjects (*nmasg*) and the name (*nom*) of the responsible lecturer for subjects with more than 6 theory groups (sorted by subject name).

ASIGNATURA

RESPONSABLE

ASIGNATURA	RESPONSABLE
Bases de Datos y Sistemas de Información	Luis Almiñana, Isaac
Computación Paralela	Delgado Cervantes, Camill
Concurrencia y Sistemas Distribuidos	Cuallado Simó, Tomás
Estructuras de Datos y Algoritmos	Dolz Eyob, Marlon
Gestión de Proyectos	Gorrís Arastey, Celia
Ingeniería del Software	Antón Álvaro, Roberto
Interfaces Persona Computador	Caballero Mondejar, Aleja
Introducción a la Informática y a la Programación	Vázquez Angulo, Alba
Lenguajes, Tecnologías y Paradigmas de la Programación	Alcañiz Campos, Àlvar
Programación	Albiñana Lucán, Carla
Sistemas Inteligentes	Barros Navalón, Antonio
Tecnología de Sistemas de Información en la Red	Ortúzar Ciborro, Laura
Teoría de Autómatas y Lenguajes Formales	Lanáquera Toledo, Marcos

13 filas seleccionadas.

5. Obtain the code (*ccen*) and name (*nmcen*) of the centers that do not have lecturers assigned (sorted by center name).

CCEN

NMCEN

-----  
C E.T.S.I. Caminos, Canales y Puertos  
X Unidad de Másteres Universitarios

6. Obtain the name (*nom*) of non-doctoral professors who do not belong to a center (sorted by lecturer name).

NOMBRE

<sup>1</sup> When a row of a query result does not fit on a line, characters will be removed at the end.

-----  
 Hernica Alejo, Wael  
 Peñarrocha Marimón, Vicente

7. Obtain the code (*ccen*) and name (*nmcen*) of the centers that do not have teachers or subjects.

CCEN	NMCEN
C	E.T.S.I. Caminos, Canales y Puertos

8. Obtain the code (*cod\_asg*) and name (*nmasg*) of the optional subjects (O) whose responsible lecturer is also responsible for a teaching area, indicating the name (*nom*) of that lecturer. Sorted by subject name.

COD_ASG	NOMBRE	RESPONSABLE
11593	Algorítmica	Nielsen Vizcarro, Adr
34566	Algoritmos Paralelos en Procesamiento de Señal (Ap	Mollá Gurrea, Héctor
34567	Computación de Altas Prestaciones en Problemas de	Mollá Gurrea, Héctor
11649	Criptografía	Lanáquera Toledo, Mar
11596	Diseño y Gestión de Bases de Datos	Luis Almiñana, Isaac
14101	Entornos de Desarrollo de Videojuegos	Furió Vitoria, Carme
33948	Experiencias en Gestión de Modelos	Arcas Lanzat, Enric
11729	Introducción a la Programación de Videojuegos	Valiño Montesinos, Ma
11575	Lenguajes y Entornos de Programación Paralela	Matos Cruz, Ismael
11569	Mantenimiento y Evolución de Software	Arcas Lanzat, Enric
11321	Programación de Dispositivos Móviles	Pedrosa Ivars, Erika
33984	Programación Gráfica	Furió Vitoria, Carmel
13670	Programación Informática en Arduino	Moltó Lavandera, Idir
33983	Realidad Virtual y Aumentada	Gutiérrez Lairón, Sar
33992	Reconocimiento Automático del Habla	Nielsen Vizcarro, Adr
33946	Sistemas de Gestión de Emergencias	Carmona Navalón, Davi

16 filas seleccionadas.

9. Obtain the center code (*ccen*), the degree code (*ctit*) and the name of the subjects (*nmasg*) with more than one credit per theory group of the teaching area whose responsible is the lecturer named 'Luis Almiñana, Isaac'. Sorted by subject name.

CCEN	CTIT	NMASG
R	156	Análisis de Requisitos de Negocio
D	2269	Analysis of Genomic Data
R	2233	Auditoría, Calidad y Gestión de Sistemas de Información
R	189	Bases de Datos
G	153	Bases de Datos
R	156	Bases de Datos y Sistemas de Información
R	2233	Ciencia de Datos
R	156	Diseño y Gestión de Bases de Datos
R	156	Diseño y Gestión de Sistemas de Información Genómicos
R	2255	Explotación de Datos Masivos
R	189	Gestión de Datos
R	156	Gestión de las Tecnologías de la Información
R	2233	Informática Médica
R	189	Proyecto II, Integración y Preparación de Datos
R	189	Seguridad de los Datos
R	156	Sistemas de Almacenamiento y Recuperación y de Informaci
R	156	Sistemas de Información Estratégicos
R	156	Tecnología de Bases de Datos

18 filas seleccionadas.



10. Obtain the name (*nom*) of the lecturers who teach a subject in a B semester (the course does not matter) in the degrees whose name contains the word 'Creativas' (sorted by lecturer name).

NOMBRE

```
-----
Cruz Puche, Elisa
Galdón Jarl, Xavier
Gutiérrez Lairón, Sara
Marqués Sebastián, Nieves
Parcet Morell, Pino
Ponz Rica, Marta
Roselló Pallarés, Diego
Sanhermelando Jordá, Ana
Torras Delgado, Pau
9 filas seleccionadas.
```

11. Obtain, for each center with more than 100 lecturers, the code (*ccen*) and name (*nmcen*) of the center and the number of degrees taught there.

CCEN	NOMBRE	TITULACIONES
R	E.T.S. de Ingeniería Informática	4

12. Obtain, for each category of lecturer (with some teaching duties), the category (*ctg*), how many credits are taught by all the lecturers within that category, and how many lecturers are in that category. Sorted by category.

CTG	CRÉDITOS	PROFESORES
ASOL-P3	1	1
ASOL-P4	18	2
ASOL-P6	81,85	10
AYD-TC	5,5	3
COD-TC	267,15	13
COL-TC	52	2
CU	516	31
TEU	408,73	12
TEU-P6	15,01	1
TU	1693,18	70
TU-P3	6	1

11 filas seleccionadas.

13. Obtain the name (*nom*) of the lecturers who are responsible for subjects which they are not teaching.

NOMBRE

```
-----
Cano Lanáquera, Guillem
Montesinos Carrión, David
Mor Ferrer, Alfons.
```

14. Obtain the code (*udo*) and name (*nudoc*) of the teaching areas that have subjects in all the centers whose name contains the string 'Inform'.

UDO NUDOC

```
-----
159 Computación
162 Computación Numérica
160 Desarrollo del Software
```

```

165 Informática Gráfica y Multimedia
161 Inteligencia Artificial
169 Programación
158 Sistemas
157 Sistemas de Información
8 filas seleccionadas.

```

15. Solve the above query, but for the string 'Bioinf'.

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

16. Obtain the code (*udo*) and name (*nudoc*) of the teaching areas that have subjects in exactly two centers.

```

UDO  NUDOC
---  -----
161  Inteligencia Artificial
162  Computación Numérica

```

17. Obtain the name (*nmasg*) of the subjects of character S in which some Phd (doctor) lecturer teaches more than 2 groups of laboratory or more than 2 groups of regular lectures (theory) (*ct*) indicating also the id (*nip*) of that lecturer and the total number of credits taught by that lecture in the subject. Ordered by subject name.

ASIGNATURA	NIP	CRÉDITOS
Conocimientos Básicos de Programación y Métodos Numéricos	2641	9
Conocimientos Básicos de Programación y Métodos Numéricos	3231	6
Conocimientos Básicos de Programación y Métodos Numéricos	1344	9
Informática	11449	10,8
Informática	20523	7,2
Informática	10580	15
Informática	31657	10,8
Informática	37691	12
Informática Aplicada	10772	16
Informática y Redes	877	2,16
Informática y Redes	1357	4,08
Introducción a la Informática y a la Programación	10115	15
Introducción a la Informática y a la Programación	10613	18
Introducción a la Informática y a la Programación	1092	15
Programación	10115	16,5
Programación	10613	16,5

16 filas seleccionad.

18. Obtain the name of the professors whose name (*nom*) contains at least one accented capital vowel and who teach subjects in more than one teaching area. Sorted alphabetically by lecturer name.

```

NOMBRE
-----
Agut Fortea, Óscar
Álvarez Pozo, Sául
Antón Álvaro, Roberto
Izquierdo Alarcón, Ángel

```

19. Obtain the name (*nmasg*) of the subjects whose name contains the string 'Datos' indicating also the name of each lecturer who teaches it.

ASIGNATURA	PROFESOR
Big Data/ Minería de Datos Geoespaciales	Ivars Bens, Diego
Bases de Datos y Sistemas de Información	Mejía Prieto, Sergio
Tecnología de Bases de Datos	Mejía Prieto, Sergio
Bases de Datos	Mejía Prieto, Sergio
Gestión de Datos	Mejía Prieto, Sergio
Tecnologías de Gestión de Datos	Mejía Prieto, Sergio
Bases de Datos y Sistemas de Información	Luis Almiñana, Isaac
Diseño y Gestión de Bases de Datos	Luis Almiñana, Isaac
Tecnología de Bases de Datos	Luis Almiñana, Isaac
Bases de Datos	Luis Almiñana, Isaac
Gestión de Datos	Luis Almiñana, Isaac
Bases de Datos	Álvarez Pozo, Sául
Bases de Datos y Sistemas de Información	Álvarez Pozo, Sául
Bases de Datos y Sistemas de Información	Burguera Beltrán, Ismael
Bases de Datos y Sistemas de Información	Cal Brú, Isaac
Estructuras de Datos	Wun Sancho, Máximo
Proyecto II, Integración y Preparación de Datos	Ochando Correa, Alfonso
Estructuras de Datos y Algoritmos	Lozano Coma, Silvia
Bases de Datos y Sistemas de Información	Cerdán Guillen, Jaime
Seguridad de los Datos	Cerdán Guillen, Jaime
Tecnología de Bases de Datos	Alegre Rocha, Moises
Estructuras de Datos y Algoritmos	Ejarque Valiente, Enrique
Bases de Datos y Sistemas de Información	Caballero Mondejar, Alejandro
Diseño y Gestión de Bases de Datos	Caballero Mondejar, Alejandro
Tecnología de Bases de Datos	Caballero Mondejar, Alejandro
Bases de Datos y Sistemas de Información	Pérez Alejo, Gracia
Bases de Datos	Leiva Luna, Nicolás
Ciencia de Datos	Leiva Luna, Nicolás
Big Data/ Minería de Datos Geoespaciales	Ayora Forteza, Modesto
Diseño y Gestión de Bases de Datos	Pedrerera Arraez, Antony
Bases de Datos y Sistemas de Información	Villarín Hernica, Jaime
Estructuras de Datos y Algoritmos	Peinado Dolz, Sara
Estructuras de Datos y Algoritmos	Baeza Vilar, Prados
Estructuras de Datos y Algoritmos	Dolz Eyob, Marlon
Estructuras de Datos y Algoritmos	Román Marrahí, Asier
Proyecto II, Integración y Preparación de Datos	Casamayor Millet, Ricard
Explotación de Datos Masivos	Casamayor Millet, Ricard
Estructuras de Datos y Algoritmos	Nielsen Vizcarro, Adrián
Estructuras de Datos y Algoritmos	Sorli Hernandez, Aitor
Estructuras de Datos y Algoritmos	Valiño Limorti, Joan
Seguridad de los Datos	Cardona Luis, Vicente
41 filas seleccionadas.	

20. Obtain the code (*udo*) of the teaching areas indicating how many subjects they have that are taught by more than four lecturers (only if they have more than one) (ordered by teaching area code).

UDO ASIGNATURAS

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--- -----
158          2
160          2
169          3
170          4

```

21. Obtain the code (*ccen*) and the name (*nmcen*) of all the centers in the database, indicating how many Phd (doctors) lecturers are assigned to each one of them.

CCEN	NMCEN	CUÁNTOS
J	E. Politécnica Superior de Alcoy	4
Q	E. Politécnica Superior de Gandía	10
E	E.T.S. de Ingeniería del Diseño	4
R	E.T.S. de Ingeniería Informática	94
C	E.T.S.I. Caminos, Canales y Puertos	0
T	E.T.S.I. de Telecomunicación	3
G	E.T.S.I. Geodésica, Cartográfica y Topografía	3
D	E.T.S.I. Industriales	5
M	Facultad de Administración y Dirección de Empresas	3
L	Facultad de Bellas Artes	10
X	Unidad de Másteres Universitarios	0

11 filas seleccionadas.

22. Obtain the name (*nom*) of the professors who teach all the subjects in a teaching area.

no se ha seleccionado ninguna fila

23. Obtain the code (*cod\_asg*) and name (*nmasg*) of all the subjects in the database that belong to a teaching area with exactly 9 subjects indicating for each subject how many lecturers teach in it (sorted by subject code)

COD_ASG	NMASG	PROFESORES
11560	Sistemas Inteligentes	12
11587	Agentes Inteligentes	3
11589	Percepción	2
11592	Técnicas, Entornos y Aplicaciones de Int	2
11594	Aprendizaje Automático	3
14096	Social Web Behaviour & Network Analysis	2
33425	Logística y Servicios	2
33436	Sistemas Inteligentes	4
34508	Big Data/ Minería de Datos Geoespaciales	2

9 filas seleccionadas.

24. Obtain the name of all the PhD lecturers responsible for a teaching area, indicating also the number of subjects they teach that have more than 3 credits of regular classes (theory) (*ct*).

NOM	CUÁNTAS
Ayora Forteza, Modesto	1
Carmona Navalón, David	1
Cuallado Simó, Tomás	2
Furió Vitoria, Carmelo	1
Gutiérrez Lairón, Sara	2
Lanáquera Toledo, Marcos	0
Lledó Novella, Ivar	2
Luis Almiñana, Isaac	4
Matos Cruz, Ismael	0
Mollá Gurrea, Héctor	1
Moltó Lavandera, Idir	1
Nielsen Vizcarro, Adrián	1
Pedrosa Ivars, Erika	0
Valiño Montesinos, Marta	0

14 filas seleccionadas.

25. Obtain the code (*ccen*) and name (*nmcen*) of all the centers in the database indicating how many PhD

and non-PhD lecturers are assigned to them. Ordered by name of the center.

CCEN	NOMBRE	DOCS	NODOCS
J	E. Politécnica Superior de Alcoy	4	4
Q	E. Politécnica Superior de Gandía	10	0
E	E.T.S. de Ingeniería del Diseño	4	1
R	E.T.S. de Ingeniería Informática	94	8
C	E.T.S.I. Caminos, Canales y Puertos	0	0
T	E.T.S.I. de Telecomunicación	3	0
G	E.T.S.I. Geodésica, Cartográfica y Topografía	3	0
D	E.T.S.I. Industriales	5	0
M	Facultad de Administración y Dirección de Empresas	3	0
L	Facultad de Bellas Artes	10	2
X	Unidad de Másteres Universitarios	0	0

11 filas seleccionadas.

26. Obtain the code (*cod\_asg*) of all the subjects in the database indicating the total number of teaching credits assigned to lecturers. If a subject is not taught by any lecturer, the number of credits should be 0. Ordered by subject code.

COD_ASG	TOTAL
0	0
10127	27
10128	9
10204	8,5
10205	8,5
10269	24
10601	32
11267	10,8
11275	9
11321	3,5
11337	18

...

34573	4
34574	4
34575	2
34576	4
34577	2
34756	4

204 filas seleccionadas.

27. How many centers are there with a lower number of subjects than the number of lecturers assigned?

CENTROS  
-----  
3

28. Obtain the code (*cod\_asg*) and name (*nmasg*) of the subject in which the most teachers teach.

COD_ASG	NMASG
11560	Sistemas Inteligentes

29. Obtain the name (*nom*) of the lecturers who teach more than 30 teaching credits among all the subjects they teach (in alphabetical order).

NOM

```

-----
Albiñana Lucán, Carla
Alcañiz Campos, Àlvar
Álvarez Pozo, Sául
Álvarez Pozo, Sául
Antón Álvaro, Roberto
Bonet España, Tomás
Brisa Carmona, Camilla
Bruhn Olmos, Daniel
Caballero Mondejar, Alejandro
Calvo Margaix, Mario
Cerdán Guillen, Jaime
Cerezuela Boronat, Julio
Cuallado Simó, Tomás
Cuevas Gadea, Gonzalo
Dolz Eyob, Marlon
Fernández-Calvillo Piles, Rafael
Ferrero Puertes, Pino
Fontela Banegas, Pau
Galdón Jarl, Xavier
Limorti Díez, Blas
Lledó Novella, Ivar
Lorente Racho, Ivar
Lozano Coma, Silvia
Luis Almiñana, Isaac
Marqués Sebastián, Nieves
Mejía Prieto, Sergio
Molió Pallarés, Xavier
Mor Ferrer, Alfons
Ochando Correa, Alfonso
Ortúzar Ciborro, Laura
Torras Delgado, Pau
Vázquez Angulo, Alba
Wun Sancho, Máximo
Yusá Vidaurre, Albert
34 filas seleccionadas.

```

30. Obtain the code (*cod\_asg*) and name (*nmasg*) of the subject with the highest number of credits per regular (theory) group (*ct*).

COD\_ASG NMSG

```

-----
14180 Programación

```

31. Obtain the name (*nom*) of the lecturers who teach in any of the subjects that belong to the degree of code 189 of the center of code (*ccen*) R and such that the subject has more than 70 students enrolled. Sorted alphabetically.

NOM

```

-----
Ejarque Valiente, Enrique
Peinado Dolz, Sara
Treviño Orts, Alexandro
Wun Sancho, Máximo.

```

32. Obtain the name (*nom*) of the professors who teach a subject in the center of code (*ccen*) J.

NOM

-----  
 Bonet Peñafiel, Ramón  
 Miret Hernández, Jorge  
 Valiño Montesinos, Marta

33. Obtain the code and the name (*nudoc*) of the teaching areas whose head has the category (*ctg*) 'TEU' only if he/she teaches only subjects of less than 2 credits of regular (*ct*) classes (theory).

UDO NUDOC

-----  
 160 DDesarrollo del Software

34. Obtain for each area of knowledge the area code indicating in each area how many professors there are in it, how many are doctors and how many are not

AREA	PROFESORES	DOCTORES	NO_DOCTORES
0035	2	2	0
0040	1	1	0
0075	17	14	3
0105	2	2	0
0185	2	1	1
0260	6	5	1
0385	1	1	0
0505	2	2	0
0560	1	1	0
0570	113	101	12
0595	1	1	0
0690	1	1	0
0785	3	3	0
0800	1	1	0

14 filas seleccionadas.

35. Obtain, for each and every center, the name of the center (*nmcen*), the number of professors assigned to it from teaching area (*udo*) 0570 and the number of subjects assigned with more than 3 theory credits (*ct*).

CENTRO	PROF	ASG
E. Politécnica Superior de Alcoy	7	1
E. Politécnica Superior de Gandía	7	1
E.T.S. de Ingeniería del Diseño	3	0
E.T.S. de Ingeniería Informática	85	26
E.T.S.I. Caminos, Canales y Puertos	0	0
E.T.S.I. de Telecomunicación	2	1
E.T.S.I. Geodésica, Cartográfica y Topografía	1	0
E.T.S.I. Industriales	4	3
Facultad de Administración y Dirección de Empresas	1	1
Facultad de Bellas Artes	1	0
Unidad de Másteres Universitarios	0	0

11 filas seleccionadas.

36. Obtain, for each teaching area with assigned subjects, the name of the teaching area (*nudoc*), the name (*nom*) of the professor responsible and the number of subjects assigned to that teaching area (sorted by teaching area name).

UNIDAD_DOCENTE	RESPONSABLE	PROF
-----	-----	-----
Computación	Lanáquera Toledo, Marcos	5
Computación Numérica	Mollá Gurrea, Héctor	6
Desarrollo del Software	Arcas Lanzat, Enric	18
Informática Gráfica y Multimedia	Gutiérrez Lairón, Sara	19
Inteligencia Artificial	Lledó Novella, Ivar	9
Máster CPD	Matos Cruz, Ismael	16
Máster IARFID	Furió Vitoria, Carmelo	22
Máster ISMFSI	Carmona Navalón, David	22
Programación	Nielsen Vizcarro, Adrián	8
Programación Básica	Moltó Lavandera, Idir	19
Sección Departamental Alcoy	Valiño Montesinos, Marta	8
Sección Departamental Gandía	Pedrosa Ivars, Erika	20
Sistemas	Cuallado Simó, Tomás	11
Sistemas de Información	Luis Almiñana, Isaac	21
14 filas seleccionadas.		

37. Obtain, for each teaching area with two or more assigned subjects, the code (*udo*) of the teaching area, the name (*nom*) of the professor responsible and the number of professors teaching more than two theory groups (*gt*) of the subjects assigned to that area (ordered by teaching area code).

UDO	RESPONSABLE	PROF
----	-----	-----
160	Arcas Lanzat, Enric	14
168	Carmona Navalón, David	0
158	Cuallado Simó, Tomás	6
167	Furió Vitoria, Carmelo	0
165	Gutiérrez Lairón, Sara	5
159	Lanáquera Toledo, Marcos	2
161	Lledó Novella, Ivar	0
157	Luis Almiñana, Isaac	4
166	Matos Cruz, Ismael	0
162	Mollá Gurrea, Héctor	0
170	Moltó Lavandera, Idir	3
169	Nielsen Vizcarro, Adrián	6
164	Pedrosa Ivars, Erika	1
163	Valiño Montesinos, Marta	0
14 filas seleccionadas		

38. Obtain the number of subjects with more regular credits (theory) (*ct*) than laboratory credits (*cp*) that are taught by at least one non-PhD lecturer.

ASIGS  
-----  
20

39. Obtain the names (*nom*) of the lecturers who teach the most subjects.

NOM  
-----  
Marqués Sebastián, Nieves  
Pedrosa Ivars, Erika

40. Obtain the code (*ccen*) and the name (*nmcen*) of the centers with fewer teachers assigned.



CCEN	NMCEN
M	Facultad de Administración y Dirección de Empresas
T	E.T.S.I. de Telecomunicación
G	E.T.S.I. Geodésica, Cartográfica y Topografía

41. Obtain the nip, category (*ctg*) and total number of groups (theory or laboratory) of the lecturer who teaches the largest number of groups (theory or laboratory).

NIP	CTG	GRUPOS
1234	TU	22

42. Obtain the name (*nom*) of the lecturers who teach all the subjects of a degree with at least two subjects

NOMBRE

-----  
 Ayora Forteza, Modesto  
 Castelló Rodríguez, Gorka  
 Fontela Banegas, Pau  
 Insa Richart, Bruno  
 Moltó Lavandera, Idir  
 Roselló Pallarés, Diego  
 6 filas seleccionadas.

43. Obtain the name of the professors (*nom*) who only teach subjects of a degree and who belong to a research group (*Grupo\_inv*) that has at least one subgroup.

NOMBRE

-----  
 Álvarez Pozo, Sául  
 Barros Navalón, Antonio  
 Bastidas Castillo, Jorge  
 Calvo Mollá, Sava  
 Cruz Puche, Elisa  
 Milla Bonet, Alejandro  
 Montés Robles, Tadeusz  
 Talavera Quintanilla, Álvaro  
 Verdet Gómez, Jorge  
 Vila Donat, Mihai  
 10 filas seleccionadas.

44. Obtain the code (*ccen*) and the name (*nmcen*) of the centers that do not have subjects or teachers assigned.

CCEN	NMCEN
C	E.T.S.I. Caminos, Canales y Puertos

45. Obtain the code (*cgi*) and name (*nombre*) of all the research groups that exist indicating how many professors belong to the group and how many research subgroups it has (ordered by name).

CGI	NOMBRE	PROF	SUBGRU
DB	Bases de Datos, Razonamiento Automático y Lenguaje Natural	13	0
ELP	Extensiones de la Programación Lógica	15	0
GCP	Grupo de Computación Paralela	15	0
OOM	Grupo de Métodos de Producción de Software	1	0

GPS	Grupo de Planificación y Scheduling	14	0
PRHLT	Grupo de Reconocimiento de Formas y Tecnología del Lenguaje	7	0
NaDie	Grupo sin éxito	0	0
SIG	Informática Gráfica	13	0
GTI-IA	Inteligencia Artificial	16	0
OOCMDB	Modelado Conceptual Orientado a Objetos y Bases de Datos	12	0
PLIS	Programación Lógica e Ingeniería del Software	10	4
RFIA	Reconocimiento de Formas e Inteligencia Artificial	6	0
SiDi	Sistemas Distribuidos	5	0
GTI	Tecnología Informática	12	3
TLCC	Teoría de Lenguajes, Computabilidad y Criptografía	6	0

15 filas seleccionadas.

46. Obtain the code (*udo*) and name (*nudoc*) of the teaching areas that have subjects in all the centers whose name (*nmcen*) contains the word 'Ingeniería'.

```
UDO NUDOC
---
158 Sistemas
```

47. Solve the above query with the word Filosofía.

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

48. Obtain the code (*cod\_asg*) and name (*nmasg*) of the subjects taught by more than 3 professors such that all the professors teaching them are of a category (*ctg*) other than 'TEU'.

```
COD_ASG NMSG
-----
Algorítmica
Estructuras de Datos y Algoritmos
Informática
Informática
Interfaces Persona Computador
Reconocimiento Automático del Habla
Sistemas Inteligentes
Sistemas Inteligentes
8 filas seleccionadas.
```