



## **Management and administration of Databases -**

### **PRACTICE Nº8**

#### **Physical data model**

##### **Objectives of the practice:**

- Tuning of the DDBB
- Implementation of the data physical model
- Modification of the physical structure of a table

##### **Necessary theory:**

- a) Lesson 4 of notes of theory
- b) "redefinicion\_fisica\_tabla.pdf" tutorial

**Number of sessions: 2**

In this practice we are going to implement some of the objects that Oracle provides for the implementation of the physical model of data. Therefore, you have to modify the physical data model to improve the performance for the following scenarios:

1. Script `CLIENTS_IMPROVEMENT.SQL`: it has been detected that is extremely frequent to query ING clients by name and surname.
2. Script `PROSPECTIVE.SQL` (paragraphs a, b, c and d): time to time, the marketing department needs to query a historical of account movements regarding balances and the age of the client. In particular, it is desirable to query attending on several age ranges, how the balance of the accounts has evolved in average. It is possible to solve it in an incremental way as follows:
  - a) Implement a PL/SQL function, `AGE_RANGE_CLIENT(dni)`, which replaces the age of the client with the age range that it belongs

Input: DNI	Output: Age Range
12345678X	1
23212312Y	2
12312453Z	1
233432112	3

Where range 1 corresponds to the interval [18-29] years, range 2 is [30-45] years, range 3 is [46-60] years and range 4 is [60-100] years.

- b) Implement a PL/SQL function, `CHANGE_BALANCE_CLIENT(dni)`, that notes down the percentage change of the global balance for every of client during the last month.

Unputt: ID card	Output: % change - balance
12345678X	+5.0
23212312Y	-32.0
12312453Z	-10.0
233432112	+20.0

The result of this function meaning is: the client 12345678X balance has been increased by a 5 % during last month (for example, from 1000 eur. on January 1 to 1050 eur. on February 1).

- c) Finally, implement a `BALANCE_AGE_RANGE_VARIATION` view to calculate the balance variation on average of the clients attending on their age range:

Age range	% balance variation
1	+5.0
2	-32.0
3	+20.0
4	+0.0

This view is interpreted as follows: the set of the clients who are between 18 and 29 years old has increased its balance a 5 %, on average.

Bearing in mind the calculation complexity of `BALANCE_AGE_RANGE_VARIATION`, which is frequently queried, but that it must be updated once a month only, how might we optimize the process?

3. Script `CLIENT-ACCOUNT.SQL`: it is known that tables `CLIENT`, `cli-CuING` and `CuING` almost always are queried together by means of a *natural join*.

**NOTE 1:** some characteristics of the physical model of data must be done at the moment of the creation of the table. For example, an index organized table (IOT). Thus, if it is required to re-define the physical structure of the table you must replace this one with other one logically equivalent but with a different physical organization. A way of accomplish this task is described in the tutorial ("physical\_table\_redefinition.pdf")

**NOTE 2:** you must keep record of your SQL scripts. Include together your code SQL a brief justification of the proposed solution. A comment of two or three lines is enough.