

# Introduction to Oracle Apex

## 1 Apex platform

Oracle Application Express (Apex) is a platform that allows the low-code development of frontend application based on DBMS Oracle. During the first laboratories, we will use a feature of Apex called SQL Workshop, that allows to write and execute SQL constructs interacting with the DBMS Oracle.

## 2 Signing-up for an Apex account

In order to have access to a free workspace on Apex, it is necessary to follow these steps:

1. Access Apex website: <https://apex.oracle.com/it/>.
2. Sign up for a free account following these links:
  - “Get started for free” (Figure 1).



Figure 1: Apex home page

- Click on Request a free workspace (second option, Figure 2).

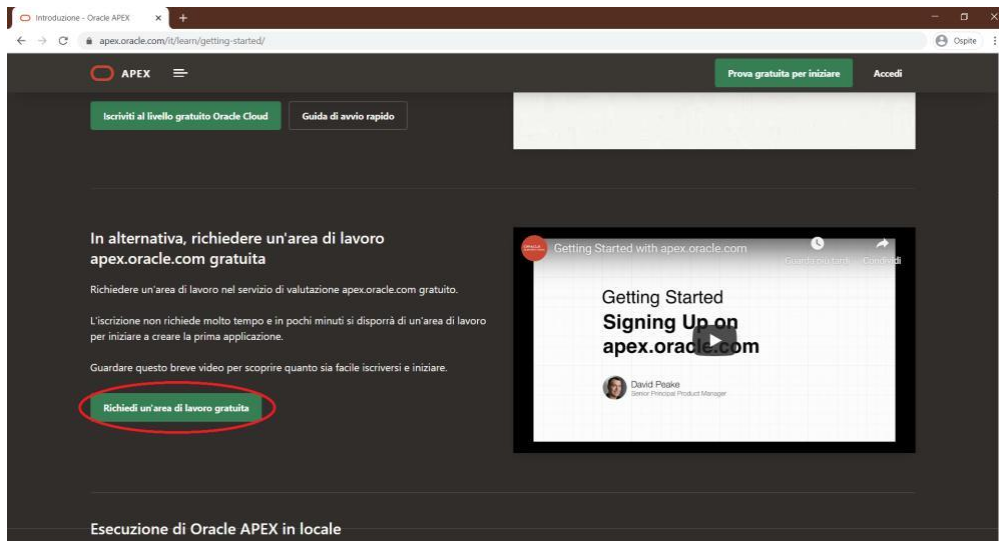


Figure 2: Request of a free workspace

3. Fill in the form with the requested data:

- The name of the workspace is an identifier of the database that you are creating (multiple databases can be associated with the same address); it must not contain special characters.
- Answer the question “Why are you signing up for this service?” with “University class usage”.

4. Wait for the confirmation e-mail (it could take a few minutes).

5. Click on the link contained in the confirmation e-mail and set the password to complete the sign-up procedure.

### 3 How to use SQL Workshop

Once you have access to Apex platform, SQL Workshop can be started through the dedicated button in the Apex dashboard (figure 3).

From here, it is possible to have access to the following functionalities (Figure 4):

- *Browser objects:* it is a graphical tool that allows to visualize all components (tables, views, indexes) present in the database, and to add new ones.
- *SQL Commands:* it provides an SQL interactive environment in which it is possible to write and execute queries.

- *SQL script: it allows to write and execute SQL scripts, that are saved for future executions.*

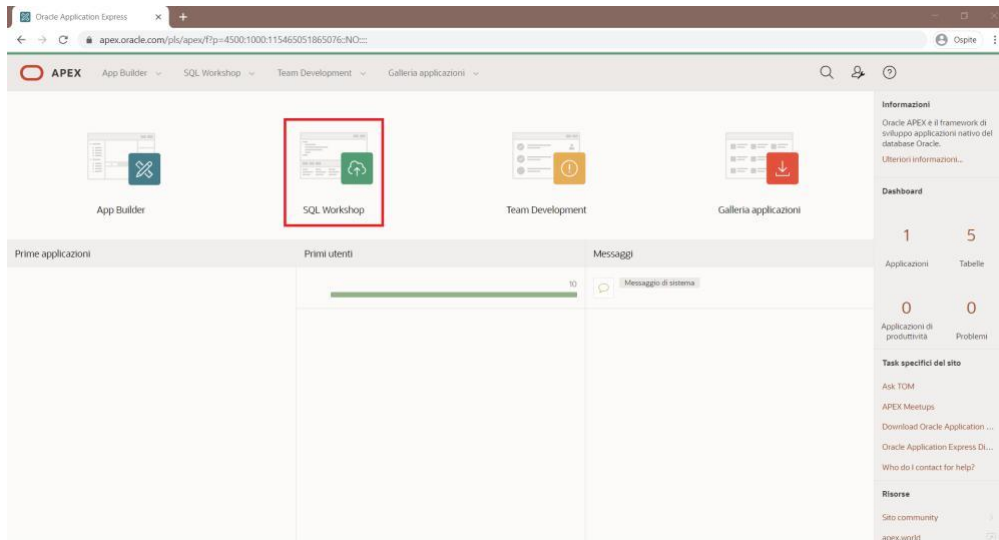


Figure 3: Apex dashboard

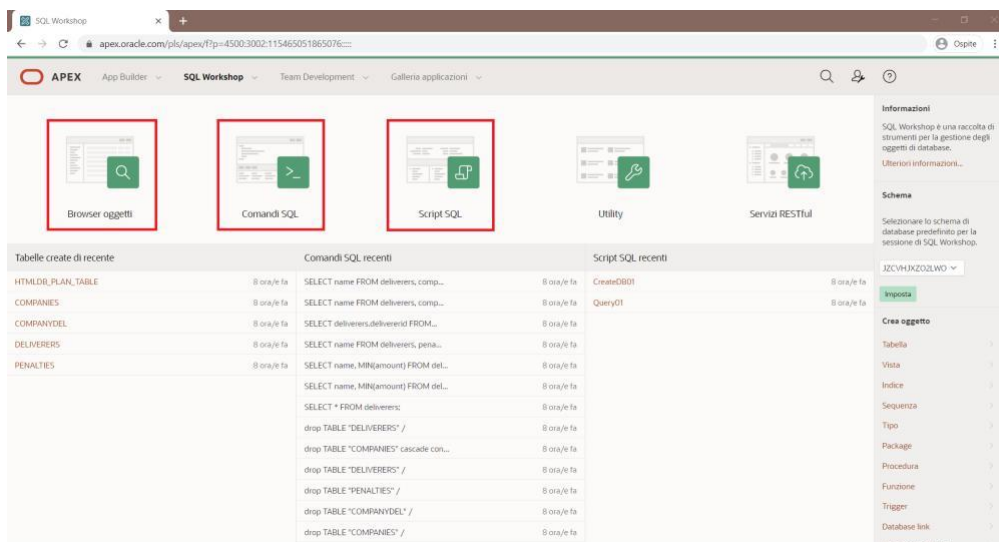


Figure 4: SQL Workshop dashboard

### 3.1 Objects browser

The objects browser interface is shown in Figure 5. The left lateral menu allows to select the object to interact with; once selected, it is possible to:

- visualize and modify the scheme through the tab *Table*; for each field of the table, name, type of date, nullability (if they can assume the NULL value) and the default value (if present) are specified. It is possible to add, modify, rename, and delete columns through the specific links, as well as rename, copy, delete or truncate (i.e. remove all stored data, keeping the scheme) the entire table.
- visualize and modify the data stored in the table, through the tab *Data*; each row represents a record, and it is possible to modify each of them. Furthermore, it is possible to write queries in an interactive fashion, insert new records or load data from an external source, through the specific commands.
- create and delete indexes, internal structures (used internally by the DBMS to speed up the access to data), through the tab *Indices*; by default, Oracle creates an index based on the primary key of each table.
- visualize constraints (of type check, primary key or referential integrity) defined on the table, through the tab *Constraints*; constraints can be automatically imposed at the creation of the table or later, and it is possible to delete, enable or disable them.

Moreover, it is possible to define new objects through the button “+”, on the right top corner.

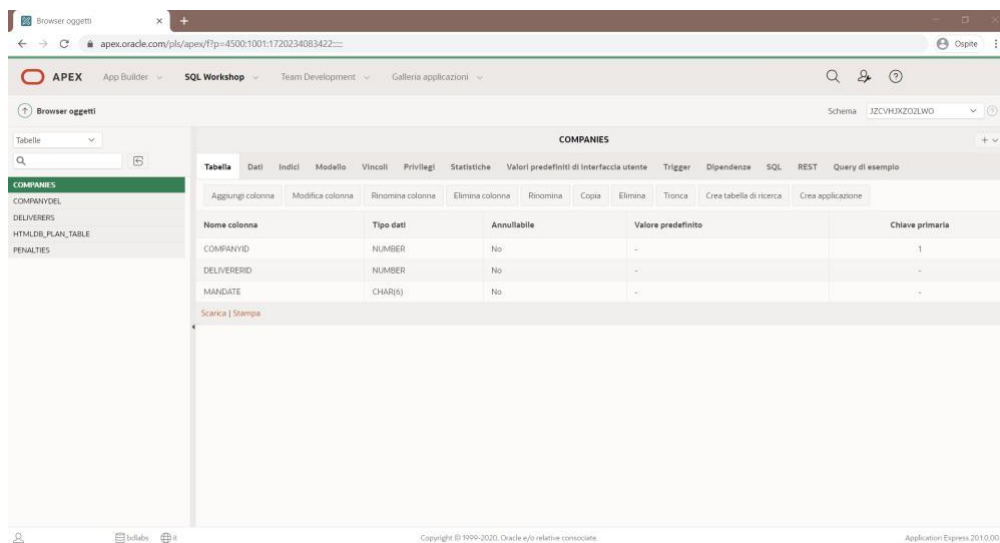


Figure 5: objects browser

### 3.2 SQL Commands

The interface of the function “SQL Commands” is shown in figure 6. It is possible to write SQL code in the central portion of the page and execute it through the specific button.

*Run*, on the right top corner; the results of the execution are shown in the tab *Results* in the bottom portion of the window. It is possible to save a script through the button *Save*; the script code will be visible in the tab *saved SQL*, from which it will be possible to load it again. For each query, it is possible to visualize the physical execution plan as compiled by the DBMS, in the tab *Explain*.

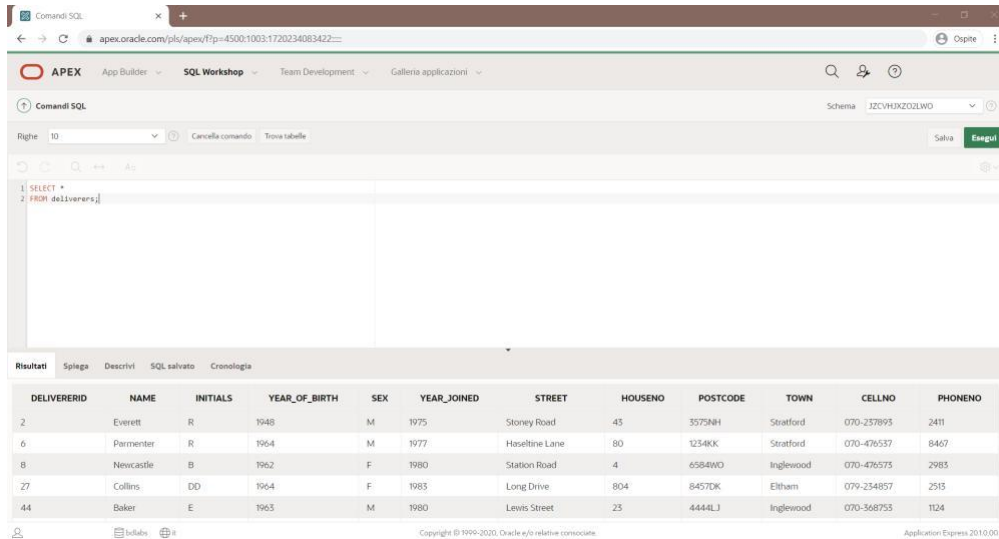


Figura 6: SQL Commands

### 3.3 SQL Script

Finally, the environment SQL Script (shown in Figure 7) allows to write and run of SQL scripts; the main difference with SQL Commands saved is that, in this case, the results of the execution of each script are preserved and it is not necessary to compute them again if the scripts and/or the related tables have not changed. The list of scripts previously defined is shown in the central part of the page; here it is possible to modify, execute them or just show the results of the previous executions.

It is possible to import scripts saved on your PC (through the button *Upload*) or export scripts defined in Apex (through the button *download* in the edit interface of the script).

*Notice:* the free version of Apex allows to run scripts whose results have dimension of at 200 KB; furthermore, the total dimension of the results of all the scripts must be lower than 2 MB. For this reason, it could be necessary to delete the results of the least recent queries through the interface *Manage Results*, accessible through the link on the right side of the page.

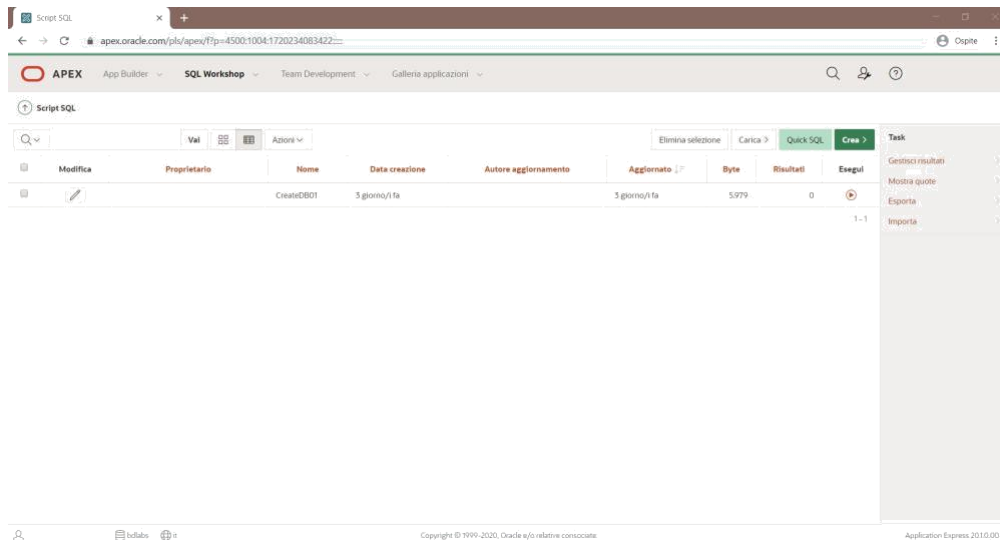


Figure 7: SQL Script

### 3.4 Extra functionalities

Through the menu *Utilities* of *SQL Workshop*, it is possible to have access to some extra functionalities, among which:

- *Data Workshop*: allows to upload and download data to and from the database in various formats.
- *Query Builder*: allows to build queries in graphic mode, that can be saved and executed in the SQL Commands tab.
- *Generate DDL*: allows to generate a SQL script for the export of databases or a subset of objects.

## 4 Import of a database

In order to carry out the laboratories exercises, it is necessary to import the required databases through the functionalities offered by the SQL script environment. In particular,

1. Access the *SQL Script* functionalities.
2. Click on the button *Upload*, in the top right section of the page.
3. Select the script for the creation of the database and give it a name (Figure 8).

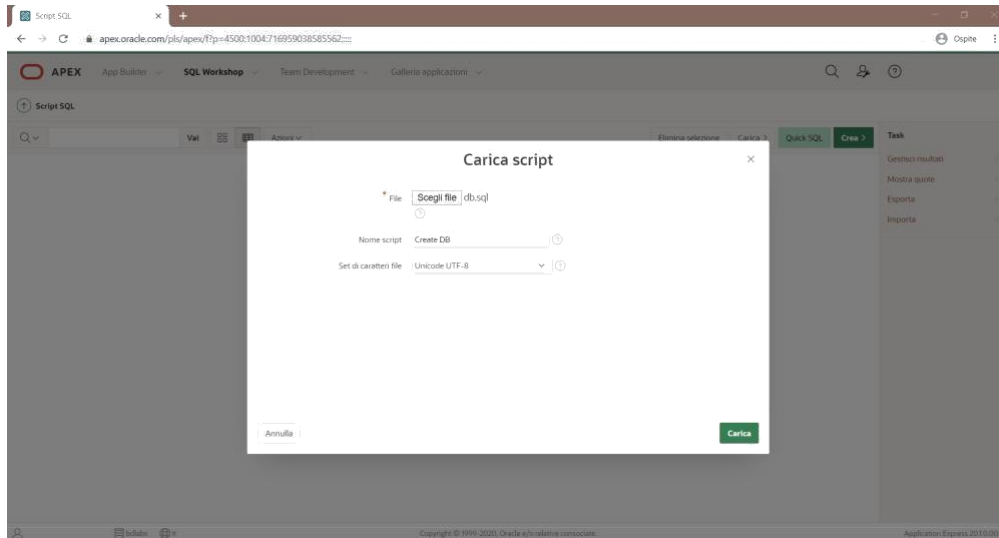


Figure 8: Upload of and SQL script

4. Run the uploaded script through the specific command and confirm the execution (Figure 9).

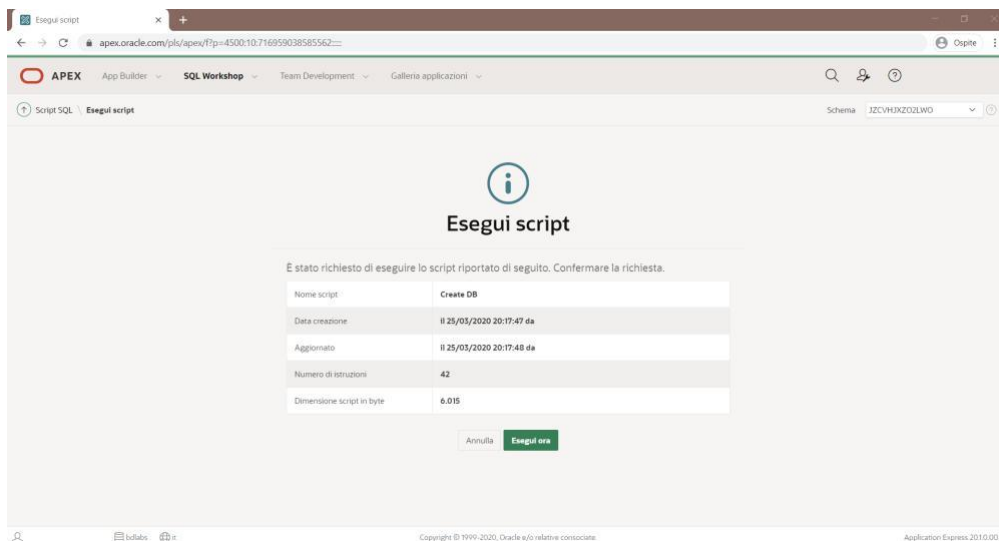


Figure 9: Confirmation of the execution of the script

If the database has been imported for the first time, it may be possible to have some errors related to the first instructions of the script. It is normal, because these are instructions of `DROP TABLE` that are needed only in the case of a second import of the database in order to remove the old copy of the tables. The remaining part of the script should work fine, creating the requested tables for carrying out of the laboratories.