



UNIVERSIDAD AUTÓNOMA DE
CHIHUAHUA

UNIVERSIDAD AUTÓNOMA DE CHIHUAHUA
Facultad de Ingeniería



Ingeniería en Ciencias de la Computación

DESARROLLO DE BASES DE DATOS

Tarea: Bases de datos y docker

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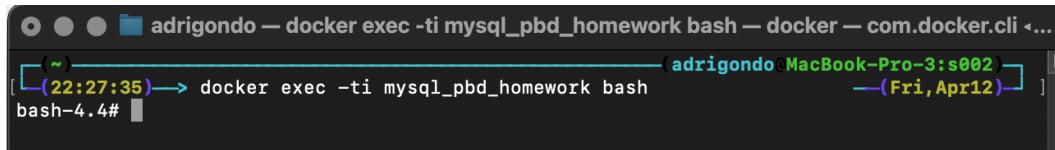
1. Crear instancia de docker con la imagen de mysql en la versión 5.7.33, enlazando la carpeta /var/lib/mysql a un volumen llamado data.

```
adrigondo ~ adrigondo@MacBook-Pro-3:~| 80x27 | ttys002 — zsh — 80x27
[~] (22:10:44)→ docker pull mysql:5.7.33
5.7.33: Pulling from library/mysql
no matching manifest for linux/arm64/v8 in the manifest list entries
[~] (22:10:56)→ docker pull mysql
Using default tag: latest
latest: Pulling from library/mysql
8b0617b3cebc: Pull complete
16ae022566ed: Pull complete
eecd18f4775b: Pull complete
556cfab8150e: Pull complete
ce811470e9ce: Pull complete
c2d2c48356cf: Pull complete
ada74d40ba87: Pull complete
3b7b27488bbe: Pull complete
7c89304473a0: Pull complete
0be02980a719: Pull complete
Digest: sha256:0f2e15fb8b47db2518b1428239ed3e3fe6a6693401b2cf19552063562fcfc2fc4
Status: Downloaded newer image for mysql:latest
docker.io/library/mysql:latest

What's Next?
View a summary of image vulnerabilities and recommendations → docker scout quickview mysql
[~] (22:11:57)→
```

```
adrigondo ~ adrigondo@MacBook-Pro-3:~| 89x27 | ttys002 — zsh — 89x27
[~] (22:24:58)→ docker run -dti -p3000:3306 --name mysql_pbd_homework --hostname mysql_pb
d_homework -e MYSQL_ROOT_PASSWORD=ImASqlDeveloper -v data:/var/lib/mysql mysql
cab1506137cd77d93b42cdcc9adb0f9d4c59d6c5b609da2c6fe32b48af8f356f
[~] (22:25:13)→ docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS
NAMES
cab1506137cd mysql "docker-entrypoint.s..." 3 seconds ago Up 3 seconds 33060/tcp
, 0.0.0.0:3000->3306/tcp mysql_pbd_homework
[~] (22:25:16)→
```

2. Entra en modo bash al contenedor e instala wget como herramienta para realizar peticiones web.



```
adrigondo — docker exec -ti mysql_pbd_homework bash — docker — com.docker.cli <...
(adrigondo@MacBook-Pro-3:s002) —(Fri,Apr12) ]
```

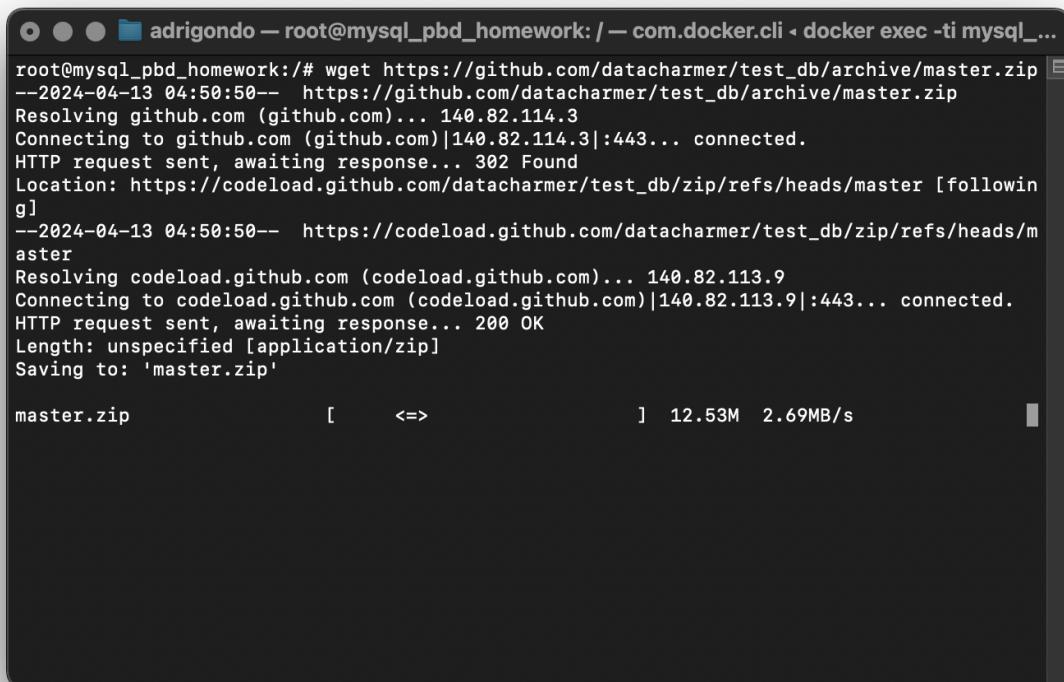
(22:27:35) → docker exec -ti mysql_pbd_homework bash
bash-4.4#

La imagen de mysql en la versión 5.7.33 no estaba disponible para sistemas arm64. Por ello instale la latest, sin embargo está versión (8.0.3), tiene un sistema operativo oraclelinux minificado, por lo cual no tiene manejadores de paquetes. Debido a eso y a no encontrar una versión que me ayudara, decidí rehacer lo anterior usando la imagen de mariadb en su versión 10.5.8.

```
docker run -dti -p3000:3306 --name mysql_pbd_homework --hostname mysql_pbd_homework -e MYSQL_ROOT_PASSWORD=ImASqlDeveloper -v data:/var/lib/mysql mariadb:10.5.8
```

Con esto, ya tenía acceso a apt-get update, y también a apt install. Por lo que pude instalar wget, y posteriormente unzip.

3. Descarga la base de datos de prueba de employees que se encuentra en el siguiente repositorio, https://github.com/datacharmer/test_db/archive/master.zip



```
adrigondo — root@mysql_pbd_homework: / — com.docker.cli — docker exec -ti mysql_...
root@mysql_pbd_homework:/# wget https://github.com/datacharmer/test_db/archive/master.zip
--2024-04-13 04:50:50--  https://github.com/datacharmer/test_db/archive/master.zip
Resolving github.com (github.com)... 140.82.114.3
Connecting to github.com (github.com)|140.82.114.3|:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: https://codeload.github.com/datacharmer/test_db/zip/refs/heads/master [following]
--2024-04-13 04:50:50--  https://codeload.github.com/datacharmer/test_db/zip/refs/heads/master
Resolving codeload.github.com (codeload.github.com)... 140.82.113.9
Connecting to codeload.github.com (codeload.github.com)|140.82.113.9|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: unspecified [application/zip]
Saving to: 'master.zip'

master.zip          [ => ] 12.53M 2.69MB/s
```

4. Instala unzip para desempaquetar el archivo descargado desde el repositorio, una vez instalado descomprime el archivo que contiene scripts de prueba.

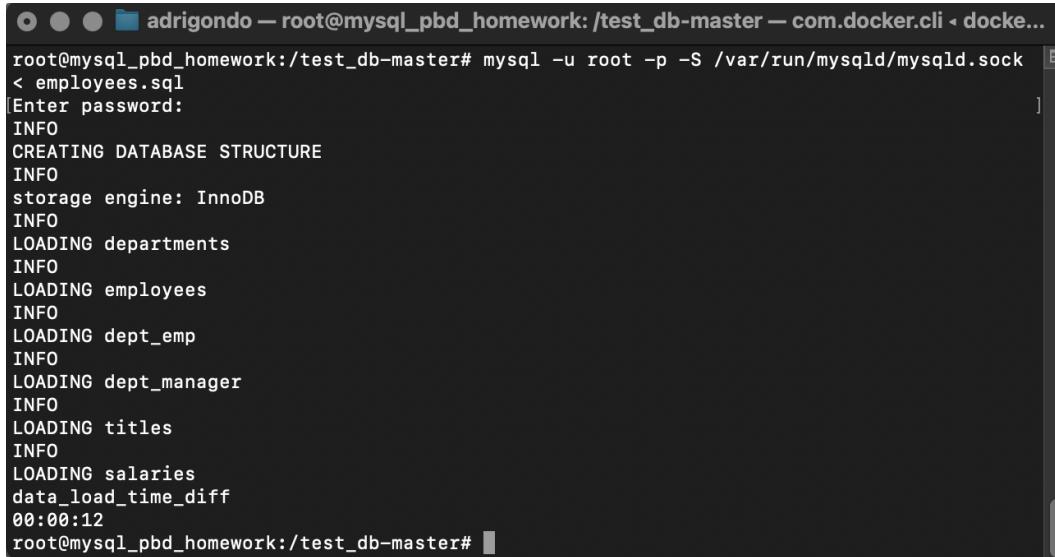
```
drigondo - root@mysql_pbd_homework: /test_db-master - com.docker.cli - docke...
drwxr-xr-x 1 root root 4096 Jan 19 2021 var
root@mysql_pbd_homework:/# unzip master.zip
Archive: master.zip
3c7fa05e04b4c339d91a43b7029a210212d48e6c
  creating: test_db-master/
  inflating: test_db-master/Changelog
  inflating: test_db-master/README.md
  inflating: test_db-master/employees.sql
  inflating: test_db-master/employees_partitioned.sql
  inflating: test_db-master/employees_partitioned_5.1.sql
  creating: test_db-master/images/
  inflating: test_db-master/images/employees.gif
  inflating: test_db-master/images/employees.jpg
  inflating: test_db-master/images/employees.png
  inflating: test_db-master/load_departments.dump
  inflating: test_db-master/load_dept_emp.dump
  inflating: test_db-master/load_dept_manager.dump
  inflating: test_db-master/load_employees.dump
  inflating: test_db-master/load_salaries1.dump
  inflating: test_db-master/load_salaries2.dump
  inflating: test_db-master/load_salaries3.dump
  inflating: test_db-master/load_titles.dump
  inflating: test_db-master/objects.sql
  creating: test_db-master/sakila/
  inflating: test_db-master/sakila/README.md
  inflating: test_db-master/sakila/sakila-mv-data.sql
  inflating: test_db-master/sakila/sakila-mv-schema.sql
  inflating: test_db-master/show_elapsed.sql
  inflating: test_db-master/sql_test.sh
  inflating: test_db-master/test_employees_md5.sql
  inflating: test_db-master/test_employees_sha.sql
  inflating: test_db-master/test_versions.sh
root@mysql_pbd_homework:/# ls -la
total 35912
```

5. Entra a la carpeta y asegúrate de que se encuentre el archivo employees.sql

```
drigondo - root@mysql_pbd_homework: /test_db-master - com.docker.cli - docke...
root@mysql_pbd_homework:/# cd test_db-master/
root@mysql_pbd_homework:/test_db-master# ls -la
total 168356
drwxr-xr-x 4 root root 4096 Aug 26 2023 .
drwxr-xr-x 1 root root 4096 Apr 13 04:51 ..
-rw-r--r-- 1 root root 964 Aug 26 2023 Changelog
-rw-r--r-- 1 root root 4325 Aug 26 2023 README.md
-rw-r--r-- 1 root root 4193 Aug 26 2023 employees.sql
-rw-r--r-- 1 root root 6276 Aug 26 2023 employees_partitioned.sql
-rw-r--r-- 1 root root 7948 Aug 26 2023 employees_partitioned_5.1.sql
drwxr-xr-x 2 root root 4096 Aug 26 2023 images
-rw-r--r-- 1 root root 250 Aug 26 2023 load_departments.dump
-rw-r--r-- 1 root root 14159880 Aug 26 2023 load_dept_emp.dump
-rw-r--r-- 1 root root 1090 Aug 26 2023 load_dept_manager.dump
-rw-r--r-- 1 root root 17722832 Aug 26 2023 load_employees.dump
-rw-r--r-- 1 root root 39806034 Aug 26 2023 load_salaries1.dump
-rw-r--r-- 1 root root 39805981 Aug 26 2023 load_salaries2.dump
-rw-r--r-- 1 root root 39080916 Aug 26 2023 load_salaries3.dump
-rw-r--r-- 1 root root 21708736 Aug 26 2023 load_titles.dump
-rw-r--r-- 1 root root 4568 Aug 26 2023 objects.sql
drwxr-xr-x 2 root root 4096 Aug 26 2023 sakila
-rw-r--r-- 1 root root 272 Aug 26 2023 show_elapsed.sql
-rwxr-xr-x 1 root root 1800 Aug 26 2023 sql_test.sh
-rw-r--r-- 1 root root 4711 Aug 26 2023 test_employees_md5.sql
-rw-r--r-- 1 root root 4715 Aug 26 2023 test_employees_sha.sql
-rwxr-xr-x 1 root root 2013 Aug 26 2023 test_versions.sh
root@mysql_pbd_homework:/test_db-master#
```

6. Ejecuta dentro del contenedor el cliente de mysql e importa el script de la siguiente manera:

```
mysql -u root -p -S /var/run/mysqld/mysqld.sock < employees.sql
```

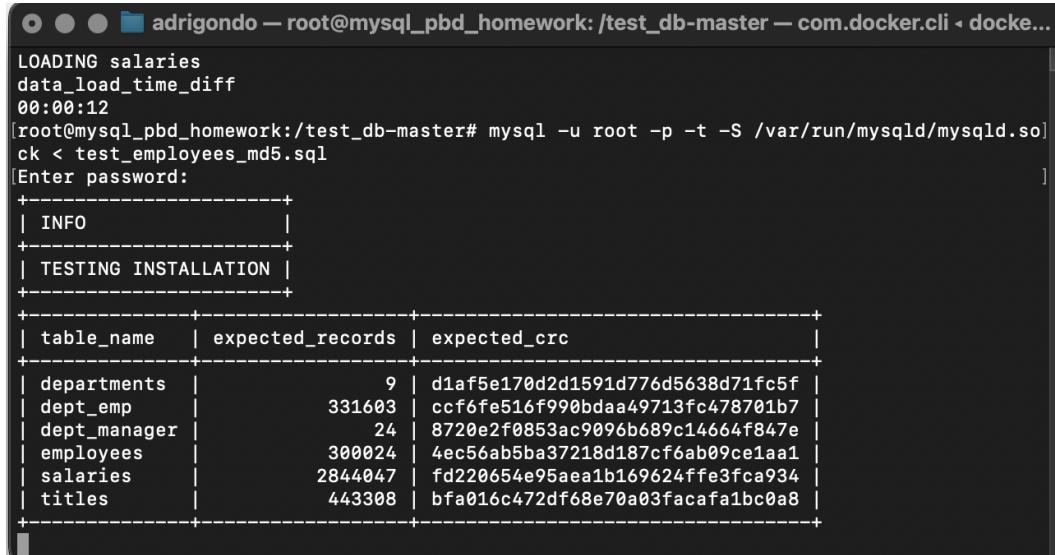


```
adrigondo — root@mysql_pbd_homework:/test_db-master — com.docker.cli • docke...
root@mysql_pbd_homework:/test_db-master# mysql -u root -p -S /var/run/mysqld/mysqld.sock < employees.sql
[Enter password: ]
```

The terminal shows the MySQL command being run to import the 'employees.sql' script. The command is: `mysql -u root -p -S /var/run/mysqld/mysqld.sock < employees.sql`. A password prompt is shown, followed by the output of the import process. The output includes various MySQL informational messages (INFO) and progress reports for loading tables like departments, employees, dept_emp, dept_manager, titles, and salaries. The total data load time is listed as 00:00:12.

7. Verifica que el pool de pruebas es correcto con el siguiente comando:

```
mysql -u root -p -t -S /var/run/mysqld/mysqld.sock < test_employees_md5.sql
```

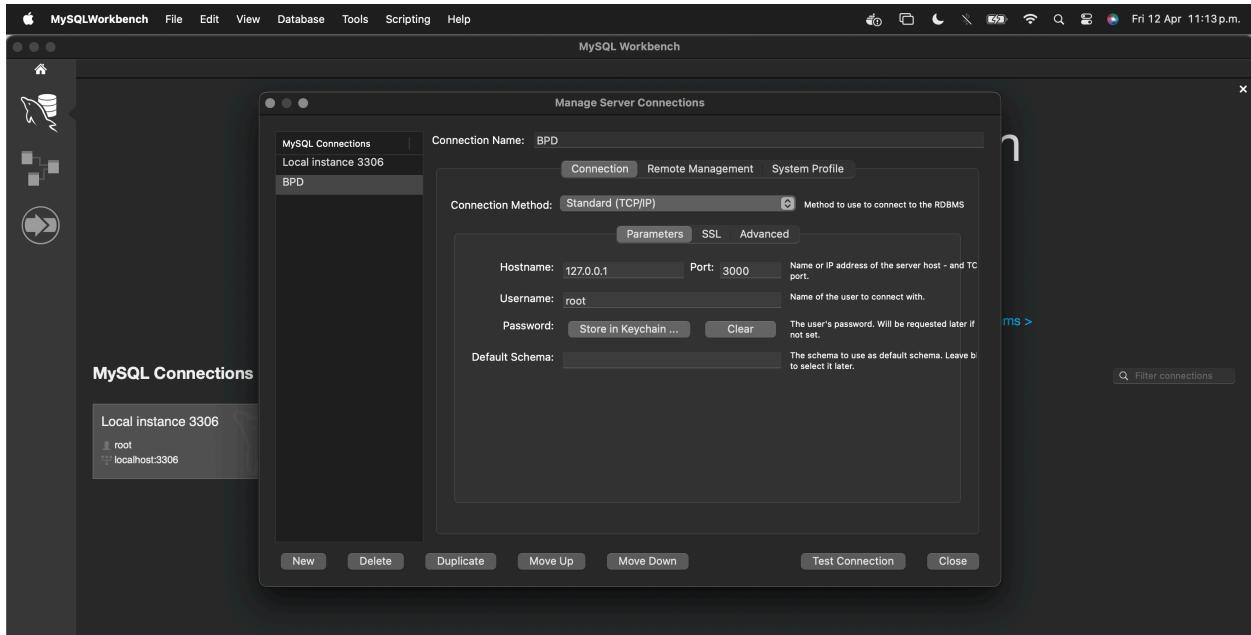


```
adrigondo — root@mysql_pbd_homework:/test_db-master — com.docker.cli • docke...
LOADING salaries
data_load_time_diff
00:00:12
[root@mysql_pbd_homework:/test_db-master# mysql -u root -p -t -S /var/run/mysqld/mysqld.sock < test_employees_md5.sql
[Enter password: ]
```

The terminal shows the MySQL command being run to verify the 'test_employees_md5.sql' script. The command is: `mysql -u root -p -t -S /var/run/mysqld/mysqld.sock < test_employees_md5.sql`. A password prompt is shown. The output displays a table comparing expected records and CRC values for six tables: departments, dept_emp, dept_manager, employees, salaries, and titles. The table structure includes columns for table_name, expected_records, and expected_crc.

table_name	expected_records	expected_crc
departments	9	d1af5e170d2d1591d776d5638d71fc5f
dept_emp	331603	ccf6fe516f990bdaa49713fc478701b7
dept_manager	24	8720e2f0853ac9096b689c14664f847e
employees	300024	4ec56ab5ba37218d187cf6ab09ce1aa1
salaries	2844047	fd220654e95aea1b169624ffe3fcfa934
titles	443308	bfa016c472df68e70a03facafa1bc0a8

8. Utilizando la herramienta Mysql Workbench realiza una conexión a la base de datos.



Para terminar contesta las siguientes preguntas:

1. ¿Cuántos empleados tienen el nombre de 'Marie'? 235

A screenshot of the MySQL Workbench interface showing a query results grid. The top bar has tabs for 'Query 1' and 'employees'. Below the tabs are various toolbar icons. The main area contains a SQL query: '1 • SELECT COUNT(*) AS mariesEmployees FROM employees WHERE employees.first_name="Marie";'. The results grid below shows one row with the column 'mariesEmployees' containing the value '235'. There are also buttons for 'Result Grid', 'Filter Rows', 'Search', and 'Export'.

2. ¿Cuántos empleados tienen por apellido 'Aamodt' ? 205

The screenshot shows the MySQL Workbench interface with a single query window titled "Query 1". The connection is set to "employees". The query is:

```
1 •  SELECT COUNT(*) AS 'Employees with lastName Aamodt' FROM employees WHERE employees.last_name="Aamodt";
```

The results are displayed in a grid titled "Employees with lastName Aamodt" with one row containing the value 205.

3. ¿Cuántas Mujeres y Hombres hay en la base de datos? 179973 hombres y 120051 mujeres

The screenshot shows the MySQL Workbench interface with a single query window titled "Query 1". The connection is set to "employees". The query is:

```
1   SELECT gender, COUNT(*) AS 'Amount'  
2   FROM employees  
3   GROUP BY gender;
```

The results are displayed in a grid with columns "gender" and "Amount", showing two rows: one for gender M with amount 179973 and one for gender F with amount 120051.