

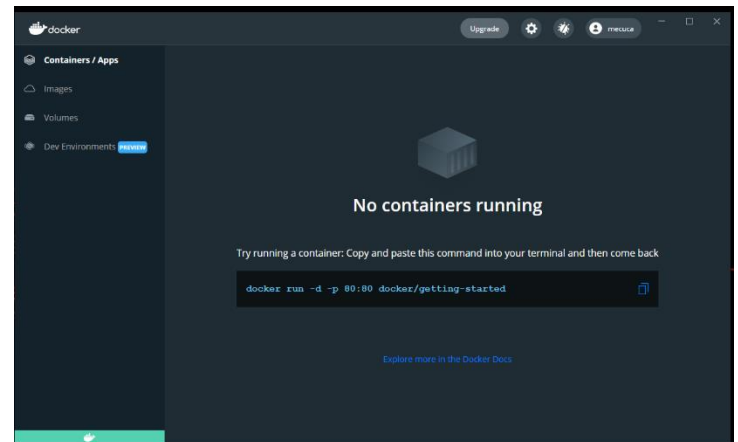
# Reporte Iniciando en Docker

Chequeando versión instalada

```
C:\WINDOWS\system32\cmd.exe

C:\Users\Moises>docker --version
Docker version 20.10.8, build 3967b7d

C:\Users\Moises>
```



Ejecutando **hello world**

```
C:\Users\Moises>docker run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
2db29710123e: Pull complete
Digest: sha256:37a0b92b08d4919615c3ee023f7ddb068d12b8387475d64c622ac30f45c29c51
Status: Downloaded newer image for hello-world:latest

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
 1. The Docker client contacted the Docker daemon.
 2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
    (amd64)
 3. The Docker daemon created a new container from that image which runs the
    executable that produces the output you are currently reading.
 4. The Docker daemon streamed that output to the Docker client, which sent it
    to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
$ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
https://hub.docker.com/

For more examples and ideas, visit:
https://docs.docker.com/get-started/

C:\Users\Moises>
```

## Ejecutando **pull busybox**

```
C:\Users\Moises>docker pull busybox
Using default tag: latest
latest: Pulling from library/busybox
24fb2886d6f6: Pull complete
Digest: sha256:f7ca5a32c10d51aeda3b4d01c61c6061f497893d7f6628b92f822f7117182a57
Status: Downloaded newer image for busybox:latest
docker.io/library/busybox:latest

C:\Users\Moises>
```

## Revisando imágenes disponibles

```
C:\Users\Moises>docker images
REPOSITORY      TAG          IMAGE ID      CREATED        SIZE
hello-world     latest      feb5d9fea6a5  4 weeks ago   13.3kB
busybox         latest      16ea53ea7c65  5 weeks ago   1.24MB

C:\Users\Moises>
```

## Ejecutando echo con busybox

```
C:\Users\Moises>docker run busybox echo "Hello from my house"
Hello from my house

C:\Users\Moises>
```

## Mostrando contenedores en ejecución

```
C:\Users\Moises>docker ps
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS        NAMES
C:\Users\Moises>
```

## Mostrando comandos ejecutados

```
C:\Users\Moises>docker ps -a
CONTAINER ID   IMAGE      COMMAND                  CREATED        STATUS        PORTS        NAMES
60263deceac0  busybox   "echo 'Hello from my..." About a minute ago   Exited (0) About a minute ago
7ed996f7c2f3  hello-world  "/hello"                10 minutes ago   Exited (0) 10 minutes ago
magical_yalow
```

```
C:\Users\Moises>docker run -it busybox sh
/ # ls
bin  dev  etc  home  proc  root  sys  tmp  usr  var
/ # uptime
06:49:54 up 34 min, 0 users, load average: 0.00, 0.00, 0.00
/ #
```

## Ejercicio Docker con Jupyter

### Obteniendo imagen

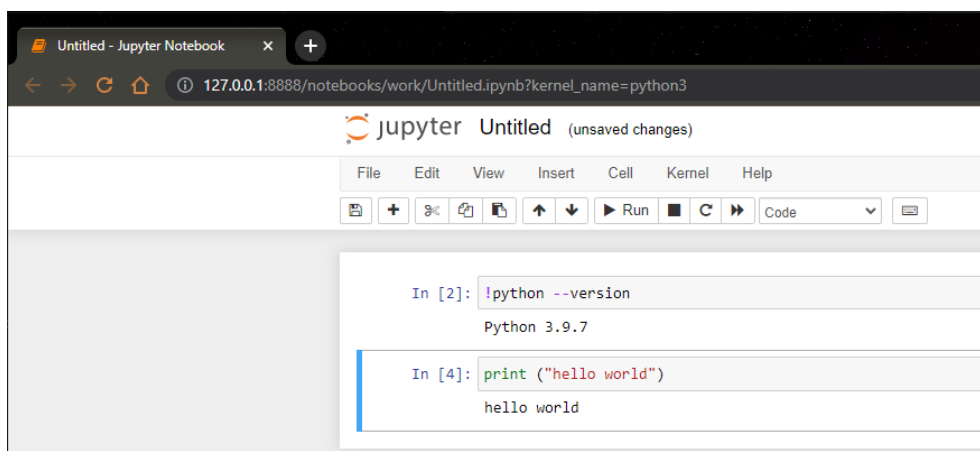
```
C:\Users\Moises>docker pull jupyter/base-notebook
Using default tag: latest
latest: Pulling from jupyter/base-notebook
7b1a6ab2e44d: Pull complete
07abfe522718: Pull complete
ec5bae5a531c: Pull complete
97a4c61238e2: Pull complete
84edc9001cfe: Pull complete
b32d33356cc8: Pull complete
3b877494cacd: Pull complete
6cdaa45956fb: Pull complete
97df9230e5a1: Pull complete
b69665e17110: Pull complete
e39d6aad6ae3: Pull complete
Digest: sha256:87238323d018bdd908a5230634c5ca834e491f4f7fff5397b914684283f22eaa
Status: Downloaded newer image for jupyter/base-notebook:latest
docker.io/jupyter/base-notebook:latest
```

### Ejecutando imagen en el puerto 8888

```
C:\Users\Moises>docker run -p 8888:8888 jupyter/base-notebook
WARN: Jupyter Notebook deprecation notice https://github.com/jupyter/docker-stacks#jupyter-notebook-deprecation-notice.
Executing the command: jupyter notebook
[I 06:57:25.415 NotebookApp] Writing notebook server cookie secret to /home/jovyan/.local/share/jupyter/runtime/notebook_cookie_secret
[W 2021-10-24 06:57:26.021 LabApp] 'ip' has moved from NotebookApp to ServerApp. This config will be passed to ServerApp. Be sure to update your config before our next release.
[W 2021-10-24 06:57:26.021 LabApp] 'port' has moved from NotebookApp to ServerApp. This config will be passed to ServerApp. Be sure to update your config before our next release.
[W 2021-10-24 06:57:26.021 LabApp] 'port' has moved from NotebookApp to ServerApp. This config will be passed to ServerApp. Be sure to update your config before our next release.
[W 2021-10-24 06:57:26.032 LabApp] 'port' has moved from NotebookApp to ServerApp. This config will be passed to ServerApp. Be sure to update your config before our next release.
[I 2021-10-24 06:57:26.032 LabApp] JupyterLab extension loaded from /opt/conda/lib/python3.9/site-packages/jupyterlab
[I 2021-10-24 06:57:26.032 LabApp] JupyterLab application directory is /opt/conda/share/jupyter/lab
[I 06:57:26.038 NotebookApp] Serving notebooks from local directory: /home/jovyan
[I 06:57:26.038 NotebookApp] Jupyter Notebook 6.4.5 is running at:
[I 06:57:26.038 NotebookApp] http://ccabe9098e47:8888/?token=021da2f2d9d848b80bd1d7797c5f4e3343472628150fd222
[I 06:57:26.038 NotebookApp] or http://127.0.0.1:8888/?token=021da2f2d9d848b80bd1d7797c5f4e3343472628150fd222
[I 06:57:26.038 NotebookApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
[C 06:57:26.043 NotebookApp]

To access the notebook, open this file in a browser:
file:///home/jovyan/.local/share/jupyter/runtime/nbserver-8-open.html
Or copy and paste one of these URLs:
http://ccabe9098e47:8888/?token=021da2f2d9d848b80bd1d7797c5f4e3343472628150fd222
or http://127.0.0.1:8888/?token=021da2f2d9d848b80bd1d7797c5f4e3343472628150fd222
[I 06:58:18.248 NotebookApp] 302 GET /?token=021da2f2d9d848b80bd1d7797c5f4e3343472628150fd222 (172.17.0.1) 0.720000ms
```

### Comprobando ejecución



```
C:\Users\Moises>docker ps
CONTAINER ID   IMAGE                COMMAND                  CREATED        STATUS        PORTS                NAMES
ccabe9098e47   jupyter/base-notebook "tiny -g -- start-no..." 4 minutes ago   Up 4 minutes   0.0.0.0:8888->8888/tcp   sweet_jemison

C:\Users\Moises>
```

Crear red virtual

```
C:\Users\Moises>docker network create --driver bridge my_test_network
6767aee5e439f69bcbd8b4308bae939ad88a1de07eb01ed859bf3cffa88793a3

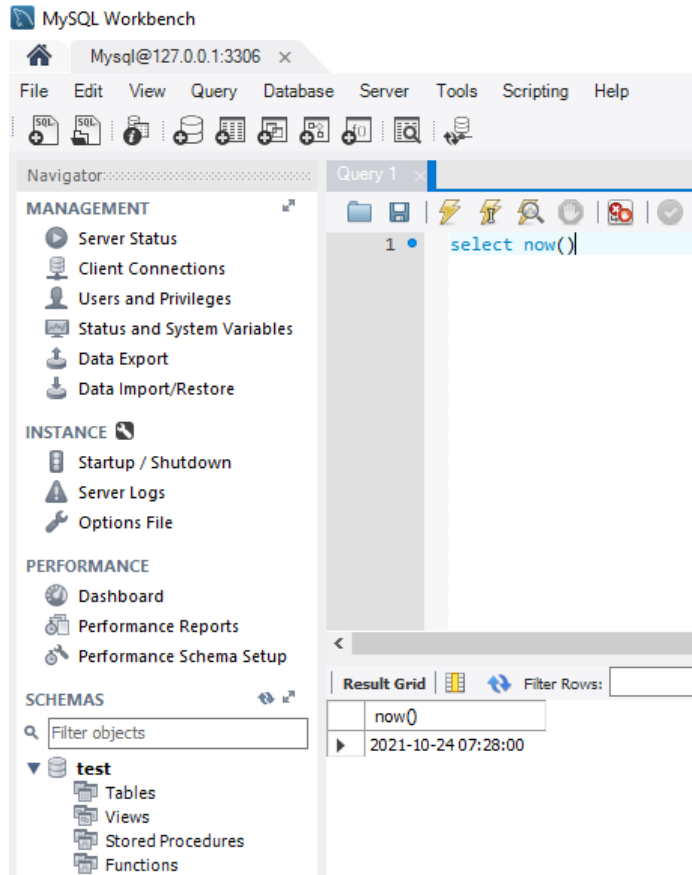
C:\Users\Moises>
```

Ejecutar imagen de MySQL

```
C:\Users\Moises>docker run -it --network my_test_network -e "MYSQL_ROOT_PASSWORD=root123" -e "MYSQL_DATABASE=test" -e "MYSQL_USER=test" -e "MYSQL_PASSWORD=test123" mysql:5.7.35
Unable to find image 'mysql:5.7.35' locally
5.7.35: Pulling from library/mysql
b380bbd43752: Pull complete
f23cbf2acc5d: Pull complete
30cf6c29c0a: Pull complete
b38609286cbe: Pull complete
8211d9e66cd6: Pull complete
2313f9eeca4a: Pull complete
7eb487d00da0: Pull complete
bb9cc5c700e7: Pull complete
88676eb32344: Pull complete
8fea0b38a348: Pull complete
3dc585bfc693: Pull complete
Digest: sha256:b8814059bbd9c80b78fe4b2b0b70cd70fe3772b3c5d8ee1edfa46791db3224f9
Status: Downloaded newer image for mysql:5.7.35
2021-10-24 07:13:01+00:00 [Note] [Entrypoint]: Entrypoint script for MySQL Server 5.7.35-1debian10 started.
2021-10-24 07:13:01+00:00 [Note] [Entrypoint]: Switching to dedicated user 'mysql'
2021-10-24 07:13:01+00:00 [Note] [Entrypoint]: Entrypoint script for MySQL Server 5.7.35-1debian10 started.
2021-10-24 07:13:01+00:00 [Note] [Entrypoint]: Initializing database files

2021-10-24T07:13:11.815325Z 0 [Note] Skipping generation of RSA key pair as key files are present in data directory.
2021-10-24T07:13:11.815818Z 0 [Note] Server hostname (bind-address): '*'; port: 3306
2021-10-24T07:13:11.815858Z 0 [Note] IPv6 is available.
2021-10-24T07:13:11.815922Z 0 [Note] - '::' resolves to '::';
2021-10-24T07:13:11.815951Z 0 [Note] Server socket created on IP: '::'.
2021-10-24T07:13:11.819246Z 0 [Warning] Insecure configuration for --pid-file: Location '/var/run/mysqld' in the path is accessible to all OS users. Consider choosing a different directory.
2021-10-24T07:13:11.825342Z 0 [Note] Event Scheduler: Loaded 0 events
2021-10-24T07:13:11.825713Z 0 [Note] mysqld: ready for connections.
Version: '5.7.35' socket: '/var/run/mysqld/mysqld.sock' port: 3306 MySQL Community Server (GPL)
```

Comprobando ejecución con MySQL Workbench



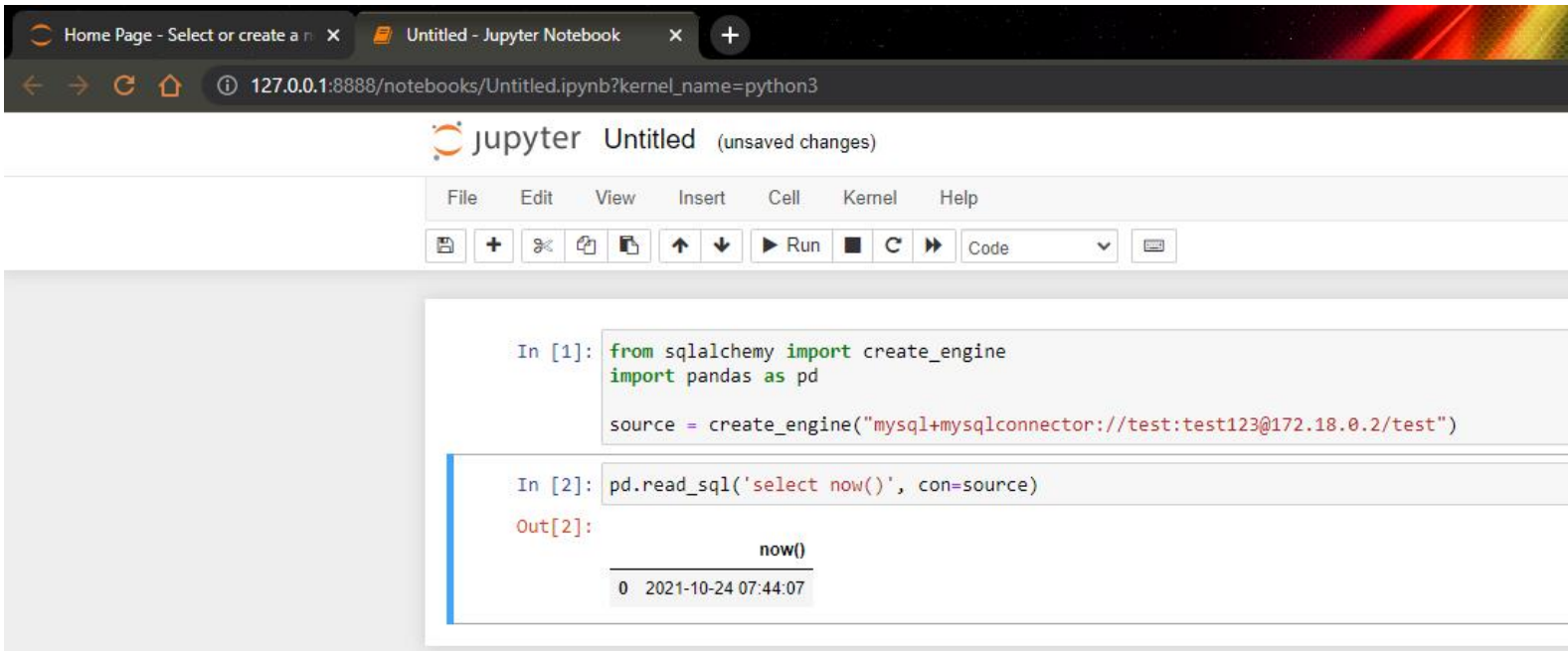
## Instalando mysql-connector-python

```
$ pip install mysql-connector-python
Collecting mysql-connector-python
  Downloading mysql_connector_python-8.0.27-1commercial-cp39-cp39-manylinux1_x86_64.whl (37.5 MB)
    |████████████████████| 37.5 MB 3.4 MB/s
Collecting protobuf>=3.0.0
  Downloading protobuf-3.19.0-cp39-cp39-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (1.1 MB)
    |██████████████████| 1.1 MB 3.6 MB/s
Installing collected packages: protobuf, mysql-connector-python
Successfully installed mysql-connector-python-8.0.27 protobuf-3.19.0
$ pip install pandas
Collecting pandas
  Downloading pandas-1.3.4-cp39-cp39-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (11.5 MB)
    |██████████████████| 11.5 MB 1.5 MB/s
Requirement already satisfied: python-dateutil>=2.7.3 in /opt/conda/lib/python3.9/site-packages (from pandas) (2.8.2)
Requirement already satisfied: pytz>=2017.3 in /opt/conda/lib/python3.9/site-packages (from pandas) (2021.3)
Collecting numpy>=1.17.3
  Downloading numpy-1.21.3-cp39-cp39-manylinux_2_12_x86_64.manylinux2010_x86_64.whl (15.7 MB)
    |██████████████████| 15.7 MB 3.8 MB/s
Requirement already satisfied: six>=1.5 in /opt/conda/lib/python3.9/site-packages (from python-dateutil>=2.7.3->pandas) (1.16.0)
Installing collected packages: numpy, pandas
Successfully installed numpy-1.21.3 pandas-1.3.4
$
```

## Ispeccionando red virtual

```
C:\Users\Moises>docker inspect network my_test_network
[
  {
    "Name": "my_test_network",
    "Id": "6767aee5e439f69bcbd8b4308bae939ad88a1de07eb01ed859bf3cffa88793a3",
    "Created": "2021-10-24T07:08:09.5671749Z",
    "Scope": "local",
    "Driver": "bridge",
    "EnableIPv6": false,
    "IPAM": {
      "Driver": "default",
      "Options": {},
      "Config": [
        {
          "Subnet": "172.18.0.0/16",
          "Gateway": "172.18.0.1"
        }
      ]
    },
    "Internal": false,
    "Attachable": false,
    "Ingress": false,
    "ConfigFrom": {
      "Network": ""
    },
    "ConfigOnly": false,
    "Containers": {
      "540a403793106555c099c7edf8a61bb5b0d381d93fe4e2ce698f62513287a5a8": {
        "Name": "modest_pasteur",
        "EndpointID": "48614f3bf444d07584b04553747408390428c9df1729757c321210af3ac68db3",
        "MacAddress": "02:42:ac:12:00:02",
        "IPv4Address": "172.18.0.2/16",
        "IPv6Address": ""
      },
      "de83bedc24fb14ea7c95c389c1db32a36ca9a7259477b3db946231f9c1c129db": {
        "Name": "infallible_blackburn",
        "EndpointID": "fee43234bb18919417b3fe2bd89cf610e9a426b17b03cd80b1a2f8d99f4ff5db",
        "MacAddress": "02:42:ac:12:00:03",
        "IPv4Address": "172.18.0.3/16",
        "IPv6Address": ""
      }
    },
    "Options": {},
    "Labels": {}
  }
]
```

## Comprobando conexión Python MySQL



The screenshot shows a Jupyter Notebook titled "Untitled" with the following code and output:

```
In [1]: from sqlalchemy import create_engine
import pandas as pd

source = create_engine("mysql+mysqlconnector://test:test123@172.18.0.2/test")

In [2]: pd.read_sql('select now()', con=source)

Out[2]:
```

now()
0 2021-10-24 07:44:07

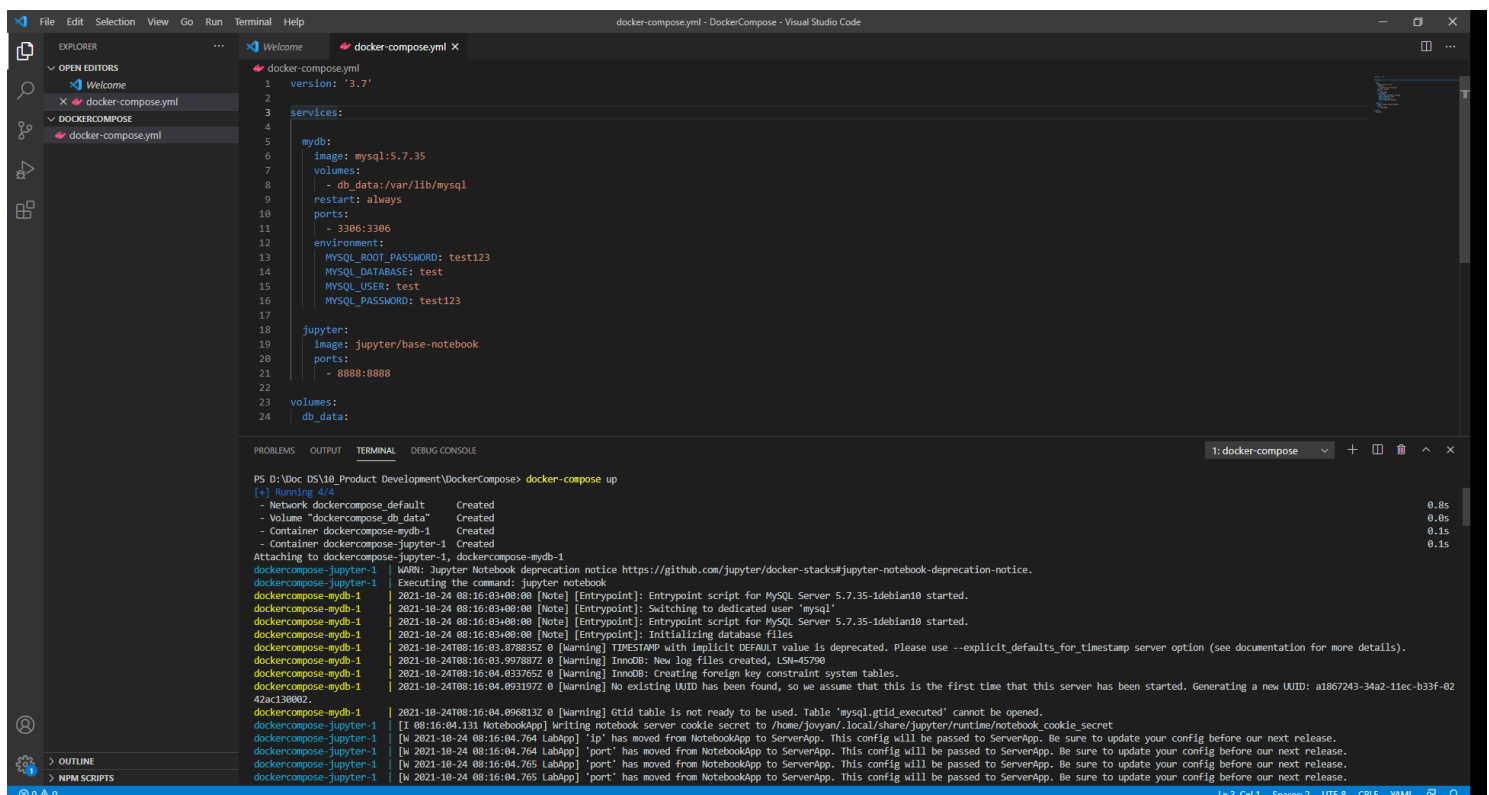
## Docker Compose

### Chequeando versión

```
C:\Users\Moises>docker-compose --version
Docker Compose version v2.0.0

C:\Users\Moises>
```

### Inicializando compose desde visual studio code



The screenshot shows the Visual Studio Code interface with the `docker-compose.yml` file open. The configuration defines two services: `mysql` and `jupyter`.

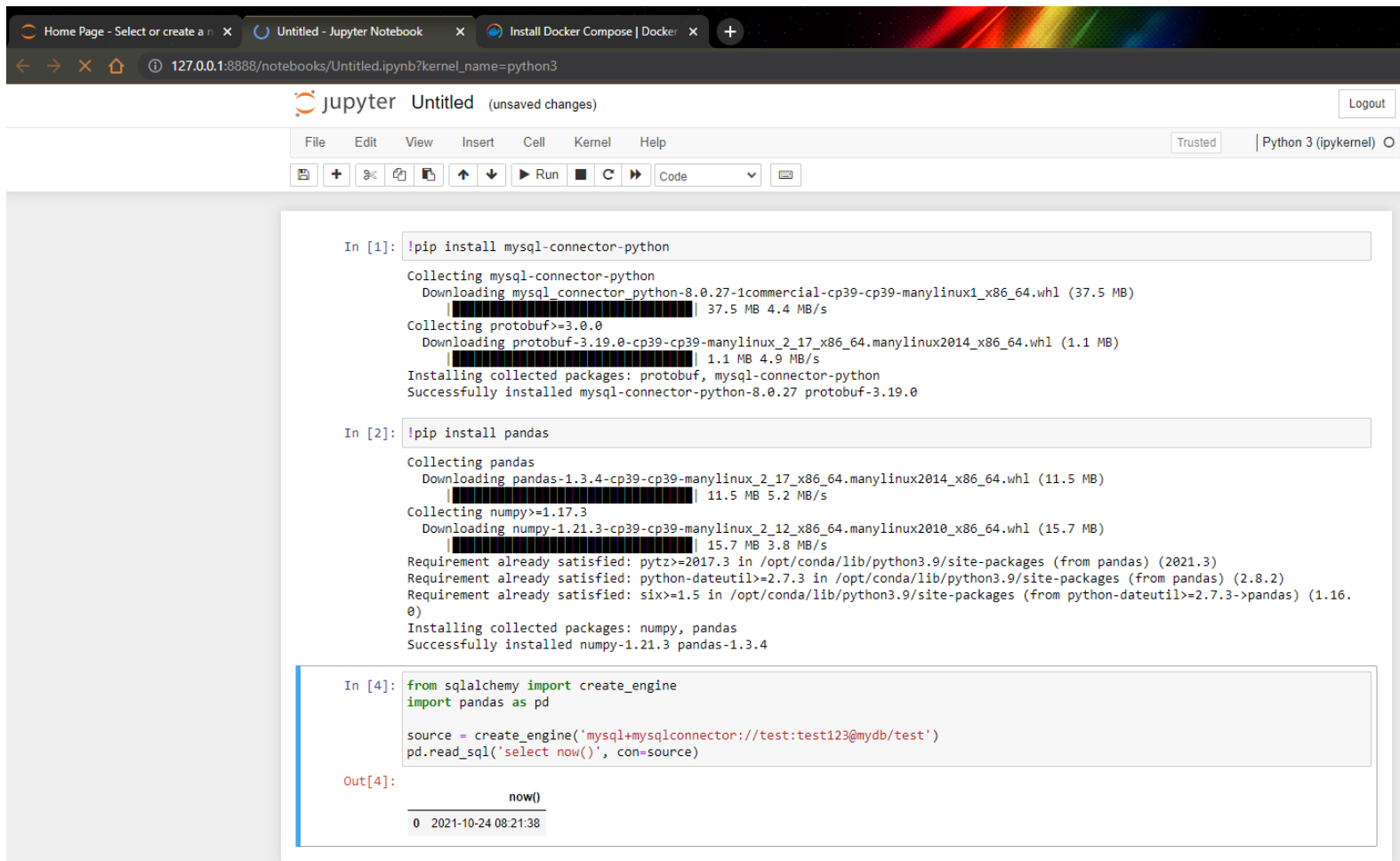
```
version: '3.7'

services:
  mysql:
    image: mysql:5.7.35
    volumes:
      - db_data:/var/lib/mysql
    restart: always
    ports:
      - 3306:3306
    environment:
      MYSQL_ROOT_PASSWORD: test123
      MYSQL_DATABASE: test
      MYSQL_USER: test
      MYSQL_PASSWORD: test123
  jupyter:
    image: jupyter/base-notebook
    ports:
      - 8888:8888
    volumes:
      - db_data:
```

The terminal output shows the command `docker-compose up` being executed, which successfully starts the containers and initializes the database.

```
PS D:\Doc DS\10_Product Development\dockercompose> docker-compose up
[+] Running 4/4
 - Network dockercompose_default Created 0.8s
 - Volume "dockercompose_db_data" Created 0.0s
 - Container dockercompose-mysql-1 Created 0.1s
 - Container dockercompose-jupyter-1 Created 0.1s
Attaching to dockercompose-jupyter-1, dockercompose-mysql-1
dockercompose-jupyter-1 | Executing the command: jupyter notebook
dockercompose-mysql-1 | 2021-10-24 08:16:03:00 [Note] [Entrypoint]: Entrypoint script for MySQL Server 5.7.35-1debian10 started.
dockercompose-mysql-1 | 2021-10-24 08:16:03:00 [Note] [Entrypoint]: Switching to dedicated user 'mysql'
dockercompose-mysql-1 | 2021-10-24 08:16:03:00 [Note] [Entrypoint]: Entrypoint script for MySQL Server 5.7.35-1debian10 started.
dockercompose-mysql-1 | 2021-10-24 08:16:03:00 [Note] [Entrypoint]: Initializing database files
dockercompose-mysql-1 | 2021-10-24T08:16:03.878352Z [Warning] TIMESTAMP with implicit DEFAULT value is deprecated. Please use --explicit_defaults_for_timestamp server option (see documentation for more details).
dockercompose-mysql-1 | 2021-10-24T08:16:03.997887Z [Warning] InnoDB: New log files created, LSN=45790
dockercompose-mysql-1 | 2021-10-24T08:16:04.033765Z [Warning] InnoDB: Creating foreign key constraint system tables.
dockercompose-mysql-1 | 2021-10-24T08:16:04.093197Z [Warning] No existing UUID has been found, so we assume that this is the first time that this server has been started. Generating a new UUID: a1867243-34a2-11ec-b33f-0242ac130002.
dockercompose-mysql-1 | 2021-10-24T08:16:04.096813Z [Warning] Gtid table is not ready to be used. Table 'mysql.gtid_executed' cannot be opened.
dockercompose-jupyter-1 | [I 08:16:04.131 NotebookApp] Writing notebook server cookie secret to /home/jovyan/.local/share/jupyter/runtime/notebook_cookie_secret
dockercompose-jupyter-1 | [W 08:16:04.208 LabApp] 'ip' has moved from NotebookApp to ServerApp. This config will be passed to ServerApp. Be sure to update your config before our next release.
dockercompose-jupyter-1 | [W 08:16:04.208 LabApp] 'port' has moved from NotebookApp to ServerApp. This config will be passed to ServerApp. Be sure to update your config before our next release.
dockercompose-jupyter-1 | [W 08:16:04.208 LabApp] 'port' has moved from NotebookApp to ServerApp. This config will be passed to ServerApp. Be sure to update your config before our next release.
```

## Comprobando desde jupyter



The screenshot shows a Jupyter Notebook interface with three tabs: "Home Page - Select or create a n...", "Untitled - Jupyter Notebook", and "Install Docker Compose | Docker". The address bar shows the URL "127.0.0.1:8888/notebooks/Untitled.ipynb?kernel\_name=python3". The notebook title is "Untitled (unsaved changes)". The interface includes a menu bar (File, Edit, View, Insert, Cell, Kernel, Help) and a toolbar with icons for file operations, running cells, and code execution. The notebook content shows two input cells and one output cell.

```
In [1]: !pip install mysql-connector-python

Collecting mysql-connector-python
  Downloading mysql_connector_python-8.0.27-1commercial-cp39-cp39-manylinux1_x86_64.whl (37.5 MB)
    37.5 MB 4.4 MB/s
Collecting protobuf<=3.0.0
  Downloading protobuf-3.19.0-cp39-cp39-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (1.1 MB)
    1.1 MB 4.9 MB/s
Installing collected packages: protobuf, mysql-connector-python
Successfully installed mysql-connector-python-8.0.27 protobuf-3.19.0

In [2]: !pip install pandas

Collecting pandas
  Downloading pandas-1.3.4-cp39-cp39-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (11.5 MB)
    11.5 MB 5.2 MB/s
Collecting numpy>=1.17.3
  Downloading numpy-1.21.3-cp39-cp39-manylinux_2_12_x86_64.manylinux2010_x86_64.whl (15.7 MB)
    15.7 MB 3.8 MB/s
Requirement already satisfied: pytz>=2017.3 in /opt/conda/lib/python3.9/site-packages (from pandas) (2021.3)
Requirement already satisfied: python-dateutil>=2.7.3 in /opt/conda/lib/python3.9/site-packages (from pandas) (2.8.2)
Requirement already satisfied: six>=1.5 in /opt/conda/lib/python3.9/site-packages (from python-dateutil>=2.7.3->pandas) (1.16.0)
Installing collected packages: numpy, pandas
Successfully installed numpy-1.21.3 pandas-1.3.4

In [4]: from sqlalchemy import create_engine
import pandas as pd

source = create_engine('mysql+mysqlconnector://test:test123@mydb/test')
pd.read_sql('select now()', con=source)

Out[4]:
```

	now()
0	2021-10-24 08:21:38