


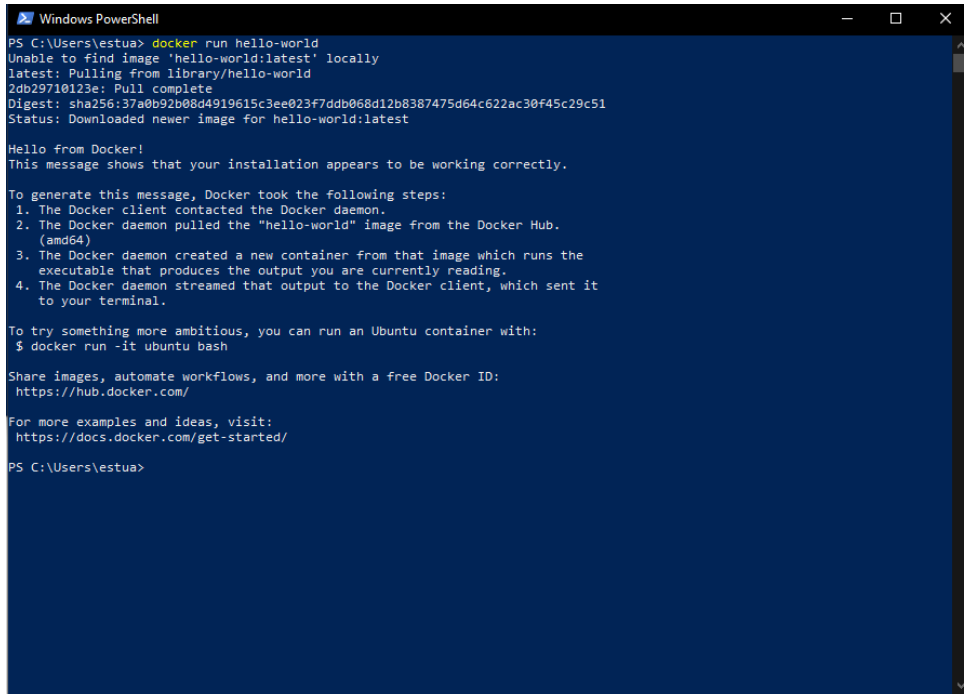
## Clase de Docker

### Instalación de Docker



```
Windows PowerShell
PS C:\Users\estua> docker --version
Docker version 20.10.8, build 3967b7d
PS C:\Users\estua>
```

### Corriendo hola mundo



```
Windows PowerShell
PS C:\Users\estua> 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/
PS C:\Users\estua>
```

## Pull busybox

```
Windows PowerShell
PS C:\Users\estua> docker pull busybox
Using default tag: latest
latest: Pulling from library/busybox
01c2cdc13739: Pull complete
Digest: sha256:15e927f78df2cc772b70713543d6b651e3cd8370abf86b2ea4644a9fba21107f
Status: Downloaded newer image for busybox:latest
docker.io/library/busybox:latest
PS C:\Users\estua>
```

## Ver imágenes

```
Windows PowerShell
PS C:\Users\estua> docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
busybox              latest             cabb9f684f8b       3 days ago         1.24MB
hello-world          latest             feb5d9fea6a5       5 weeks ago        13.3kB
quay.io/keycloak/keycloak 15.0.1            159ffed8877e       2 months ago       714MB
PS C:\Users\estua>
```

## Enviando parámetros al correr un container

```
Windows PowerShell
PS C:\Users\estua> docker run busybox echo "Hello world from Galileo Master Javier Navarro - 20015565"
Hello world from Galileo Master Javier Navarro - 20015565
PS C:\Users\estua>
```

## Listando contenedores

```
Windows PowerShell
PS C:\Users\estua> docker ps -a
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS              NAMES
5b7b87cdd083       busybox            "echo 'Hello world f..." About a minute ago  Exited (0) About a minute ago
46e89ad992cd       hello-world        "/hello"            4 minutes ago      Exited (0) 4 minutes ago
667ce3c54979       quay.io/keycloak/keycloak:15.0.1 "/opt/jboss/tools/do..." 2 months ago      Exited (0) 2 months ago
bfcc5efec037       quay.io/keycloak/keycloak:15.0.1 "/opt/jboss/tools/do..." 2 months ago      Created
PS C:\Users\estua>
```

## Ejecutar de forma interactiva un contenedor

```
Windows PowerShell
PS C:\Users\estua> docker run -it busybox sh
/ # ls
bin  dev  etc  home  proc  root  sys  tmp  usr  var
/ # uptime
 21:53:07 up 2:56, 0 users, load average: 0.00, 0.00, 0.00
/ # exit
PS C:\Users\estua>
```

## Eliminar contenedor

```
Windows PowerShell
PS C:\Users\estua> docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
77150687364f	busybox	"sh"	About a minute ago	Exited (0)	About a minute ago	boring_keldysh
5b7b87cdd003	busybox	"echo 'Hello world f..."	3 minutes ago	Exited (0)	3 minutes ago	wonderful_cannon
46e89ad929cd	hello-world	"/hello"	7 minutes ago	Exited (0)	7 minutes ago	busy_babbage
667ce3c54979	quay.io/keycloak/keycloak:15.0.1	"/opt/jboss/tools/do..."	2 months ago	Exited (0)	2 months ago	elegant_wozniak
bfcc5efec037	quay.io/keycloak/keycloak:15.0.1	"/opt/jboss/tools/do..."	2 months ago	Created		wizardly_booth

```
PS C:\Users\estua> docker rm 77150687364f
77150687364f
PS C:\Users\estua> docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
5b7b87cdd003	busybox	"echo 'Hello world f..."	4 minutes ago	Exited (0)	4 minutes ago	wonderful_cannon
46e89ad929cd	hello-world	"/hello"	8 minutes ago	Exited (0)	8 minutes ago	busy_babbage
667ce3c54979	quay.io/keycloak/keycloak:15.0.1	"/opt/jboss/tools/do..."	2 months ago	Exited (0)	2 months ago	elegant_wozniak
bfcc5efec037	quay.io/keycloak/keycloak:15.0.1	"/opt/jboss/tools/do..."	2 months ago	Created		wizardly_booth

```
PS C:\Users\estua>
```

## Instalando Jupyter

```
Windows PowerShell
77150687364f
PS C:\Users\estua> docker ps -a
```

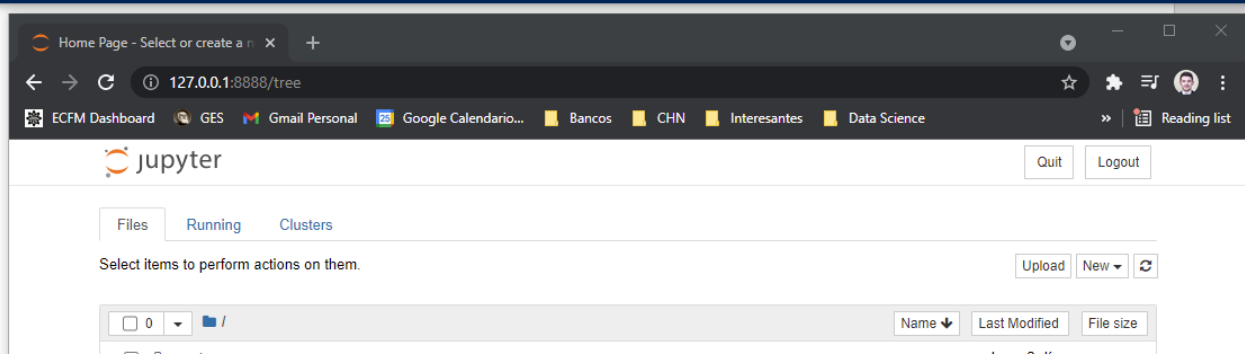
CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
5b7b87cdd003	busybox	"echo 'Hello world f..."	4 minutes ago	Exited (0)	4 minutes ago	wonderful_cannon
46e89ad929cd	hello-world	"/hello"	8 minutes ago	Exited (0)	8 minutes ago	busy_babbage
667ce3c54979	quay.io/keycloak/keycloak:15.0.1	"/opt/jboss/tools/do..."	2 months ago	Exited (0)	2 months ago	elegant_wozniak
bfcc5efec037	quay.io/keycloak/keycloak:15.0.1	"/opt/jboss/tools/do..."	2 months ago	Created		wizardly_booth

```
PS C:\Users\estua> docker pull jupyter/base-notebook
Using default tag: latest
latest: Pulling from jupyter/base-notebook
7b1a6ab2e44d: Pull complete
aae7ac7ba423: Pull complete
ac5e015e0bca: Pull complete
d7ee77f7580c: Pull complete
a5db759ff9c8: Pull complete
c464ee64836c: Pull complete
ae5313d07705: Pull complete
0c52b58dd46b: Extracting [=====>] 77.99MB/87.66MB
6030cc7cf343: Download complete
25203b1e1be1: Download complete
464a3cf035e8: Download complete
```

## Mapeo de puertos y despliegue

```
Windows PowerShell
[W 2021-10-30 21:58:33.287 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 2021-10-30 21:58:33.287 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 2021-10-30 21:58:33.287 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 2021-10-30 21:58:33.287 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 2021-10-30 21:58:33.303 LabApp] JupyterLab extension loaded from /opt/conda/lib/python3.9/site-packages/jupyterlab
[I 2021-10-30 21:58:33.303 LabApp] JupyterLab application directory is /opt/conda/share/jupyter/lab
[I 21:58:33.312 NotebookApp] Serving notebooks from local directory: /home/jovyan
[I 21:58:33.313 NotebookApp] Jupyter Notebook 6.4.5 is running at:
[I 21:58:33.313 NotebookApp] http://9c89658ebc03:8888/?token=8f57a52ff797b0d11976d8f7f9e176ecfdc820fb09ec087e
[I 21:58:33.313 NotebookApp] or http://127.0.0.1:8888/?token=8f57a52ff797b0d11976d8f7f9e176ecfdc820fb09ec087e
[I 21:58:33.313 NotebookApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
C 21:58:33.320 NotebookApp]

To access the notebook, open this file in a browser:
file:///home/jovyan/.local/share/jupyter/runtime/nbserver-7-open.html
Or copy and paste one of these URLs:
http://9c89658ebc03:8888/?token=8f57a52ff797b0d11976d8f7f9e176ecfdc820fb09ec087e
or http://127.0.0.1:8888/?token=8f57a52ff797b0d11976d8f7f9e176ecfdc820fb09ec087e
I 21:58:49.237 NotebookApp] 302 GET / (172.17.0.1) 1.350000ms
I 21:58:49.247 NotebookApp] 302 GET /tree? (172.17.0.1) 1.350000ms
I 21:59:28.418 NotebookApp] 302 GET / (172.17.0.1) 0.890000ms
I 21:59:28.427 NotebookApp] 302 GET /tree? (172.17.0.1) 1.190000ms
I 21:59:45.788 NotebookApp] 302 GET /?token=8f57a52ff797b0d11976d8f7f9e176ecfdc820fb09ec087e (172.17.0.1) 1.090000ms
```



## Crear una red

```
Windows PowerShell
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\estua> docker network create --driver bridge my_test_network
3828ec5feb9d1d8026390fd49d1055f4e2bb9cccc76d5bac1922120999ca67919
PS C:\Users\estua>
```

## Correr jupyter en la red

```
Windows PowerShell
PS C:\Users\estua> docker run -p 8888:8888 --network my_test_network jupyter/base-notebook
WARN: Jupyter Notebook deprecation notice https://github.com/jupyter/docker-stacks#jupyter-notebook-deprecation-notice.
Executing the command: jupyter notebook
[I 22:05:51.213 NotebookApp] Writing notebook server cookie secret to /home/jovyan/.local/share/jupyter/runtime/notebook_cookie_secret
[W 2021-10-30 22:05:52.128 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 2021-10-30 22:05:52.128 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 2021-10-30 22:05:52.128 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 2021-10-30 22:05:52.128 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 2021-10-30 22:05:52.144 LabApp] JupyterLab extension loaded from /opt/conda/lib/python3.9/site-packages/jupyterlab
[I 2021-10-30 22:05:52.144 LabApp] JupyterLab application directory is /opt/conda/share/jupyter/lab
[I 22:05:52.153 NotebookApp] Serving notebooks from local directory: /home/jovyan
[I 22:05:52.153 NotebookApp] Jupyter Notebook 6.4.5 is running at:
[I 22:05:52.153 NotebookApp] http://b18d0a14196a:8888/?token=eb6ade2605beb8d3b6ef25b0a2f7a6ba746bb0c97296a75e
[I 22:05:52.153 NotebookApp] or http://127.0.0.1:8888/?token=eb6ade2605beb8d3b6ef25b0a2f7a6ba746bb0c97296a75e
[I 22:05:52.153 NotebookApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
[C 22:05:52.166 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://b18d0a14196a:8888/?token=eb6ade2605beb8d3b6ef25b0a2f7a6ba746bb0c97296a75e
or http://127.0.0.1:8888/?token=eb6ade2605beb8d3b6ef25b0a2f7a6ba746bb0c97296a75e
```

## Correr Mysql en la red creada

```
Windows PowerShell
PS C:\Users\estua> docker run -it --network my_test_network -e "MYSQL_ROOT_PASSWORD=root123" -e "MYSQL_DATABASE=test" --name "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
f23cbf2ecc5d: Pull complete
30cfc6c29c0a: Pull complete
b38609286cbe: Pull complete
8211d9e66cd6: Pull complete
2313f9eeca4a: Pull complete
7eb487d00da0: Pull complete
bb9cc5c700e7: Pull complete
88676eb32344: Pull complete
8fea0b38a348: Pull complete
3dc585bf6c93: Pull complete
Digest: sha256:b8814059bbd9c80b78fe4b2b0b70cd70fe3772b3c5d8ee1edfa6791db3224f9
Status: Downloaded newer image for mysql:5.7.35

Windows PowerShell
n be changed. See the man page of setpriority().
2021-10-30T22:08:32.658304Z 0 [Note] InnoDB: Highest supported file format is Barracuda.
2021-10-30T22:08:32.723326Z 0 [Note] InnoDB: Creating shared tablespace for temporary tables
2021-10-30T22:08:32.723422Z 0 [Note] InnoDB: Setting file './ibtmp1' size to 12 MB. Physically writing the file full; Please wait ...
2021-10-30T22:08:32.765163Z 0 [Note] InnoDB: File './ibtmp1' size is now 12 MB.
2021-10-30T22:08:32.766029Z 0 [Note] InnoDB: 96 redo rollback segment(s) found. 96 redo rollback segment(s) are active.
2021-10-30T22:08:32.766119Z 0 [Note] InnoDB: 32 non-redo rollback segment(s) are active.
2021-10-30T22:08:32.767176Z 0 [Note] InnoDB: 5.7.35 started; log sequence number 12658916
2021-10-30T22:08:32.767702Z 0 [Note] InnoDB: Loading buffer pool(s) from /var/lib/mysql/ib_buffer_pool
2021-10-30T22:08:32.767932Z 0 [Note] Plugin 'FEDERATED' is disabled.
2021-10-30T22:08:32.771286Z 0 [Note] InnoDB: Buffer pool(s) load completed at 211030 22:08:32
2021-10-30T22:08:32.776358Z 0 [Note] Found ca.pem, server-cert.pem and server-key.pem in data directory. Trying to enable SSL support using them.
2021-10-30T22:08:32.776439Z 0 [Note] Skipping generation of SSL certificates as certificate files are present in data directory.
2021-10-30T22:08:32.776448Z 0 [Warning] A deprecated TLS version TLSv1 is enabled. Please use TLSv1.2 or higher.
2021-10-30T22:08:32.776451Z 0 [Warning] A deprecated TLS version TLSv1.1 is enabled. Please use TLSv1.2 or higher.
2021-10-30T22:08:32.777803Z 0 [Warning] CA certificate ca.pem is self signed.
2021-10-30T22:08:32.777892Z 0 [Note] Skipping generation of RSA key pair as key files are present in data directory.
2021-10-30T22:08:32.778961Z 0 [Note] Server hostname (bind-address): '*'; port: 3306
2021-10-30T22:08:32.779231Z 0 [Note] IPv6 is available.
2021-10-30T22:08:32.779280Z 0 [Note] - '::' resolves to '::';
2021-10-30T22:08:32.779347Z 0 [Note] Server socket created on IP: '::'.
2021-10-30T22:08:32.793754Z 0 [Warning] Insecure configuration for --pid-file: Location '/var/run/mysqld' in the path is not accessible to all OS users. Consider choosing a different directory.
2021-10-30T22:08:32.804767Z 0 [Note] Event Scheduler: Loaded 0 events
2021-10-30T22:08:32.805353Z 0 [Note] mysqld: ready for connections.
Version: '5.7.35' socket: '/var/run/mysqld/mysqld.sock' port: 3306 MySQL Community Server (GPL)
```

## Instalando driver de mysql en contenedor Jupyter

```
Windows PowerShell
Usage: docker exec [OPTIONS] CONTAINER COMMAND [ARG...]

Run a command in a running container
PS C:\Users\estua> docker ps
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS        PORTS                    NAMES
bf312570c49c   jupyter/base-notebook   "tiny -g -- start-no..."   About a minute ago   Up About a minute   0.0.0.0:8888->8888/tcp, :::8888->8888/tcp   stoic_morse
22916a08054e   mysql:5.7.35   "docker-entrypoint.s..."   4 minutes ago       Up 4 minutes       3306/tcp, 33060/tcp       optimistic_keldysh

PS C:\Users\estua> docker exec -it stoic_morse sh
sh: 1: !pip: not found
$ !pip install mysql-connector-python
$ python --version
Python 3.9.7
$ 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-3.19.1-cp39-cp39-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (1.1 MB)
    | 1.1 MB 5.3 MB/s
Installing collected packages: protobuf, mysql-connector-python
Successfully installed mysql-connector-python-8.0.27 protobuf-3.19.1
$ 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 7.2 MB/s
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 12.4 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: 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
```

## Conectando el notebook a la base de datos MySQL

```
jupyter Untitled (unsaved changes) Logout

File Edit View Insert Cell Kernel Help Trusted Python 3 (ipykernel)

In [3]: from sqlalchemy import create_engine
import pandas as pd

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

In [4]: pd.read_sql('select now()', con=source)

Out[4]:
          now()
0  2021-10-30 22:23:10

},
  "Internal": false,
  "Attachable": false,
  "Ingress": false,
  "ConfigFrom": {
    "Network": ""
  },
  "ConfigOnly": false,
  "Containers": {
    "22916a08054e73c738f313dcb43543c8d2a7496930a1f7a4edf88ace3f3de5f2": {
      "Name": "optimistic_keldysh",
      "EndpointID": "55d2ba80333575f4e30665e897c9829232035269d6c3e1e89cc49a78f9cf5d59",
      "MacAddress": "02:42:ac:12:00:02",
      "IPv4Address": "172.18.0.2/16",
      "IPv6Address": ""
    },
    "bf312570c49cb1561fc6d2c0031298e9905bcd629dc2f577395325cb677920eb": {
      "Name": "stoic_morse",
      "EndpointID": "e55dbd74985a1bfbb094a655fcab38d7850867e3e2296196e31707bf92d4b509",
      "MacAddress": "02:42:ac:12:00:03",
      "IPv4Address": "172.18.0.3/16",
      "IPv6Address": ""
    }
  },
  "Options": {},
  "Labels": {}
}
PS C:\Users\estua> docker ps
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS        PORTS                    NAMES
bf312570c49c   jupyter/base-notebook   "tiny -g -- start-no..."   11 minutes ago   Up 11 minutes   0.0.0.0:8888->8888/tcp, :::8888->8888/tcp   stoic_morse
22916a08054e   mysql:5.7.35   "docker-entrypoint.s..."   14 minutes ago   Up 14 minutes   3306/tcp, 33060/tcp       optimistic_keldysh
PS C:\Users\estua>
```

## Usando Docker compose

```
Windows PowerShell
PS D:\OneDrive - Universidad Galileo\Maestria en DS\PAPO\Trimestre4\ProductDev\Tareas> docker-compose up
Starting productdev_mydb_1 ... done
Starting productdev_jupyter_1 ... done
Attaching to productdev_jupyter_1, productdev_mydb_1
jupyter_1 | WARN: Jupyter Notebook deprecation notice https://github.com/jupyter/docker-stacks#jupyter-notebook-deprecation-notice.
jupyter_1 | Executing the command: jupyter notebook
mydb_1 | 2021-10-30 22:36:33+00:00 [Note] [Entrypoint]: Entrypoint script for MySQL Server 5.7.35-1debian10 started.
mydb_1 | 2021-10-30 22:36:33+00:00 [Note] [Entrypoint]: Switching to dedicated user 'mysql'
mydb_1 | 2021-10-30 22:36:33+00:00 [Note] [Entrypoint]: Entrypoint script for MySQL Server 5.7.35-1debian10 started.
jupyter_1 | [I 22:36:33.564 NotebookApp] Writing notebook server cookie secret to /home/jovyan/.local/share/jupyter/runtime/notebook_cookie_secret
mydb_1 | 2021-10-30T22:36:33.773253Z 0 [Warning] TIMESTAMP with implicit DEFAULT value is deprecated. Please use --explicit_defaults_for_timestamp server option (see documentation for more details).
mydb_1 | 2021-10-30T22:36:33.775348Z 0 [Note] mysqld (mysqld 5.7.35) starting as process 1 ...
mydb_1 | 2021-10-30T22:36:33.780293Z 0 [Note] InnoDB: PUNCH HOLE support available
mydb_1 | 2021-10-30T22:36:33.780472Z 0 [Note] InnoDB: Mutexes and rw_locks use GCC atomic builtins
mydb_1 | 2021-10-30T22:36:33.780485Z 0 [Note] InnoDB: Uses event mutexes
mydb_1 | 2021-10-30T22:36:33.780492Z 0 [Note] InnoDB: GCC builtin __atomic_thread_fence() is used for memory barrier
mydb_1 | 2021-10-30T22:36:33.780497Z 0 [Note] InnoDB: Compressed tables use zlib 1.2.11
```