EJercicio instalación y configuración Docker:

Después de la instalación y configuración se empieza con los comandos:

Comando Docker pull busybox:

```
Microsoft Windows [Version 10.0.19042.1288]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Gary>docker run hello-word
Unable to find image 'hello-word:latest' locally
docker: Error response from daemon: pull access denied for hello-word, repository does not exist or may require 'docker
login': denied: requested access to the resource is denied.
See 'docker run --help'.

C:\Users\Gary>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

C:\Users\Gary>
```

Docker images

```
C:\Users\Gary>docker images
REPOSITORY              TAG       IMAGE ID       CREATED       SIZE
busybox                 latest    cabb9f684f8b   2 days ago    1.24MB
mysql                   5.7.35    8a8a506ccfdc   2 weeks ago   448MB
jupyter/base-notebook   latest    f14b646c836f   2 weeks ago   668MB
busybox                 <none>    16ea53ea7c65   6 weeks ago   1.24MB

C:\Users\Gary>
```

Docker ps:

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

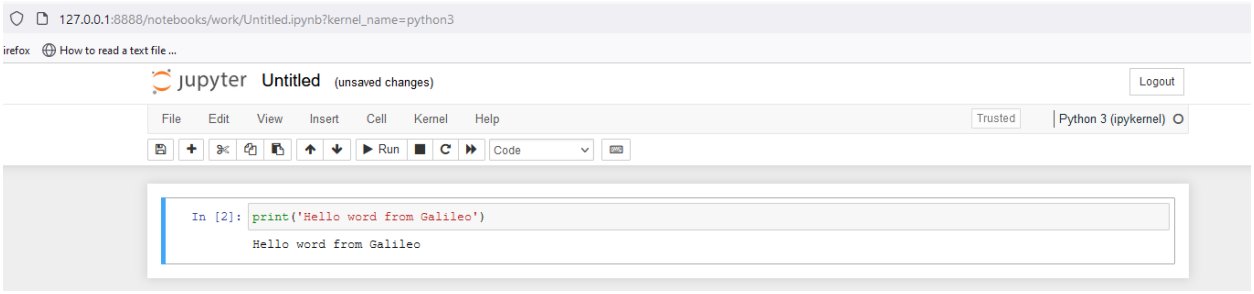
Docker run -it busybox

```
C:\Users\Gary>Docker run -it busybox
/ # ls
bin   dev   etc   home  proc  root  sys   tmp   usr   var
/ # pwd
/
/ #
```

docker run -p 8888:8888 jupyter/base-notebook

```
C:\Users\Gary>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 00:20:35.070 NotebookApp] Writing notebook server cookie secret to /home/jovyan/.local/share/jupyter/runtime/notebook
_cookie_secret
[W 2021-10-30 00:20:35.906 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 00:20:35.906 LabApp] 'port' has moved from NotebookApp to ServerApp. This config will be passed to ServerA
pp. Be sure to update your config before our next release.
[W 2021-10-30 00:20:35.906 LabApp] 'port' has moved from NotebookApp to ServerApp. This config will be passed to ServerA
pp. Be sure to update your config before our next release.
[W 2021-10-30 00:20:35.906 LabApp] 'port' has moved from NotebookApp to ServerApp. This config will be passed to ServerA
pp. Be sure to update your config before our next release.
[I 2021-10-30 00:20:35.924 LabApp] JupyterLab extension loaded from /opt/conda/lib/python3.9/site-packages/jupyterlab
[I 2021-10-30 00:20:35.924 LabApp] JupyterLab application directory is /opt/conda/share/jupyter/lab
[I 00:20:35.933 NotebookApp] Serving notebooks from local directory: /home/jovyan
[I 00:20:35.933 NotebookApp] Jupyter Notebook 6.4.4 is running at:
[I 00:20:35.933 NotebookApp] http://30d1651b2663:8888/?token=d4585da950b0052aafc7e3af26435c8728e6b25464d88381
[I 00:20:35.933 NotebookApp]  or http://127.0.0.1:8888/?token=d4585da950b0052aafc7e3af26435c8728e6b25464d88381
[I 00:20:35.933 NotebookApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
[C 00:20:35.941 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://30d1651b2663:8888/?token=d4585da950b0052aafc7e3af26435c8728e6b25464d88381
     or http://127.0.0.1:8888/?token=d4585da950b0052aafc7e3af26435c8728e6b25464d88381
```




```
C:\Users\Gary>docker ps
CONTAINER ID   IMAGE                 COMMAND                  CREATED         STATUS         PORTS
NAMES
30d1651b2663   jupyter/base-notebook   "tini -g -- start-no…"   2 minutes ago   Up 2 minutes   0.0.0.0:8888->8888/tcp
lucid_engelbart

C:\Users\Gary>
```

Ejecución del contenedor de Mysql:

docker run -it --network my_test_network -p 3306:3306 -e "MYSQL_ROOT_PASSWORD=root123" -e "MYSQL_DATABASE=test" -e "MYSQL_USER=test" -e "MYSQL_PASSWORD=test123" mysql:5.7.35

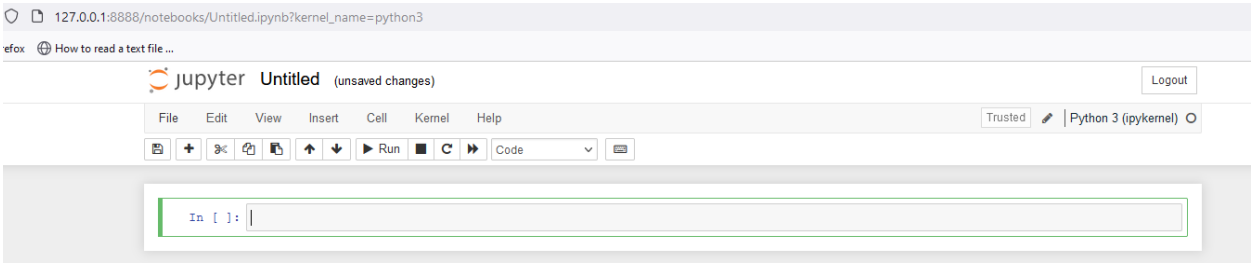
```
C:\Users\Gary>docker run -it --network my_test_network -p 3306:3306 -e "MYSQL_ROOT_PASSWORD=root123" -e "MYSQL_DATABASE=
test" -e "MYSQL_USER=test" -e "MYSQL_PASSWORD=test123" mysql:5.7.35
2021-10-30 00:28:03+00:00 [Note] [Entrypoint]: Entrypoint script for MySQL Server 5.7.35-1debian10 started.
2021-10-30 00:28:04+00:00 [Note] [Entrypoint]: Switching to dedicated user 'mysql'
2021-10-30 00:28:04+00:00 [Note] [Entrypoint]: Entrypoint script for MySQL Server 5.7.35-1debian10 started.
2021-10-30 00:28:04+00:00 [Note] [Entrypoint]: Initializing database files
2021-10-30T00:28:04.189183Z 0 [Warning] TIMESTAMP with implicit DEFAULT value is deprecated. Please use --explicit_defau
lts_for_timestamp server option (see documentation for more details).
2021-10-30T00:28:04.529706Z 0 [Warning] InnoDB: New log files created, LSN=45790
2021-10-30T00:28:04.586587Z 0 [Warning] InnoDB: Creating foreign key constraint system tables.
2021-10-30T00:28:04.612751Z 0 [Warning] No existing UUID has been found, so we assume that this is the first time that t
his server has been started. Generating a new UUID: 3f544035-3918-11ec-8e4a-0242ac120002.
2021-10-30T00:28:04.620432Z 0 [Warning] Gtid table is not ready to be used. Table 'mysql.gtid_executed' cannot be opened
.
2021-10-30T00:28:05.605981Z 0 [Warning] A deprecated TLS version TLSv1 is enabled. Please use TLSv1.2 or higher.
2021-10-30T00:28:05.606024Z 0 [Warning] A deprecated TLS version TLSv1.1 is enabled. Please use TLSv1.2 or higher.
2021-10-30T00:28:05.606776Z 0 [Warning] CA certificate ca.pem is self signed.
2021-10-30T00:28:05.953793Z 1 [Warning] root@localhost is created with an empty password ! Please consider switching off
 the --initialize-insecure option.
```

Ejecución del contenedor Jupyter Notebook dentro de la misma red:

docker run --network my_test_network -p 8888:8888 jupyter/base-notebook.

```
C:\Users\Gary>docker run --network my_test_network -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 00:38:31.313 NotebookApp] Writing notebook server cookie secret to /home/jovyan/.local/share/jupyter/runtime/notebo
_cookie_secret
[W 2021-10-30 00:38:32.083 LabApp] 'ip' has moved from NotebookApp to ServerApp. This config will be passed to ServerA
. Be sure to update your config before our next release.
[W 2021-10-30 00:38:32.084 LabApp] 'port' has moved from NotebookApp to ServerApp. This config will be passed to Serve
pp. Be sure to update your config before our next release.
[W 2021-10-30 00:38:32.084 LabApp] 'port' has moved from NotebookApp to ServerApp. This config will be passed to Serve
pp. Be sure to update your config before our next release.
[W 2021-10-30 00:38:32.084 LabApp] 'port' has moved from NotebookApp to ServerApp. This config will be passed to Serve
pp. Be sure to update your config before our next release.
[I 2021-10-30 00:38:32.096 LabApp] JupyterLab extension loaded from /opt/conda/lib/python3.9/site-packages/jupyterlab
[I 2021-10-30 00:38:32.096 LabApp] JupyterLab application directory is /opt/conda/share/jupyter/lab
[I 00:38:32.104 NotebookApp] Serving notebooks from local directory: /home/jovyan
[I 00:38:32.104 NotebookApp] Jupyter Notebook 6.4.4 is running at:
[I 00:38:32.104 NotebookApp] http://b3469e6b4d57:8888/?token=6ef0d4640533fdd72cd27b2e384ad21ea203cd1709f74f68
[I 00:38:32.104 NotebookApp]  or http://127.0.0.1:8888/?token=6ef0d4640533fdd72cd27b2e384ad21ea203cd1709f74f68
[I 00:38:32.104 NotebookApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
[C 00:38:32.111 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://b3469e6b4d57:8888/?token=6ef0d4640533fdd72cd27b2e384ad21ea203cd1709f74f68
     or http://127.0.0.1:8888/?token=6ef0d4640533fdd72cd27b2e384ad21ea203cd1709f74f68
```



docker network inspect my_test_network

```
C:\Users\Gary>docker network inspect my_test_network
[
    {
        "Name": "my_test_network",
        "Id": "f0239405d4d205cab781c3ee2edad325011faf6c58845e40f6d85dea4fe21fdd",
        "Created": "2021-10-16T01:21:01.3811493Z",
        "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": {
            "20214e2e81b94c62fd54eb9c9b43ac12e06db043787b5e84f8060a97ed95407e": {
                "Name": "angry_lewin",
                "EndpointID": "f7e19727aff7f74a360de328f25cf8e6384e85b0267ab703753bd384c95b62d1",
                "MacAddress": "02:42:ac:12:00:02",
                "IPv4Address": "172.18.0.2/16",
                "IPv6Address": ""
            },
            "b3469e6b4d57888dd2abda08790290e847aa93fadf2e9aa81608d96fa1a029c5": {
```

Instalando Mysql a Jupyter:

pip install mysql-connector-python

```
In [*]: 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)
             |▌                               | 317 kB 102 kB/s eta 0:06:04
```

Conectándose a la base de datos desde jupyter:

```
In [4]: from sqlalchemy import create_engine

In [5]: source = create_engine('mysql+mysqlconnector://test:test123@172.18.0.2/test')
```

Instalando pandas y probando la conexión a BD:

```
In [6]: pip install pandas

        Collecting pandas
          Downloading pandas-1.3.4-cp39-cp39-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (11.5 MB)
             |[redacted]| 11.5 MB 441 kB/s eta 0:00:01     |[redacted]| 8.5 MB 535 kB/s
        eta 0:00:06
        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)
             |[redacted]| 15.7 MB 4.8 MB/s eta 0:00:01     |[redacted]| 13.6 MB 258 kB/
        s eta 0:00:09
        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
        Note: you may need to restart the kernel to use updated packages.
```

```
In [7]: import pandas as pd
        pd.read_sql('select now()', con=source)
```

Out[7]:

	now()
0	2021-10-30 00:53:58

Creando el archivo .yaml

```yaml
version: '2.0'

services:

  db:
    image: mysql:5.7.35
    volumes:
      - db_data:/var/lib/mysql
    restart: always
    ports:
      - 3306:3306
    enviroment:
      MYSQL_ROOT_PASSWORD: test123
      MYSQL_DATABASE: test
      MYSQL_USER: test
      MYSQL_PASSWORD: test123

    jupyter:
      image: jupyter/base-notebook
      ports:
        - 8888:8888

volumes:
  db_data:
```

Usando el archivo creado:

docker compose up

```
C:\Users\Gary>docker ps
CONTAINER ID   IMAGE                 COMMAND                  CREATED          STATUS          PORTS                               NA
ES
b3469e6b4d57   jupyter/base-notebook   "tini -g -- start-no…"   44 minutes ago   Up 44 minutes   0.0.0.0:8888->8888/tcp              fu
ny_booth
20214e2e81b9   mysql:5.7.35          "docker-entrypoint.s…"   55 minutes ago   Up 55 minutes   0.0.0.0:3306->3306/tcp, 33060/tcp   an
ry_lewin
```

Conectandose a la base de datos desde Jupyter:

```
In [5]: source = create_engine('mysql+mysqlconnector://test:test123@db/test')
```

```
In [8]: pd.read_sql('select now()', con=source)
```

Out[8]:

	now()
0	2021-10-30 01:32:17