

Clase Docker

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Run

```
edds@ASUS-ROG-EDDS MINGW64 ~  
$ docker run hello-world
```

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/>

Pull

```
edds@ASUS-ROG-EDDS MINGW64 ~  
$ 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
```

Images

```
edds@ASUS-ROG-EDDS MINGW64 ~
$ docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
busybox	latest	cabb9f684f8b	2 days ago	1.24MB
docker101tutorial	latest	071d46fc922c	2 weeks ago	28.3MB
jupyter/base-notebook	latest	f14b646c836f	2 weeks ago	668MB
alpine/git	latest	612b988140be	2 weeks ago	27.4MB
mysql	5.7.35	9f35042c6a98	4 weeks ago	448MB
mysql	latest	2fe463762680	4 weeks ago	514MB
hello-world	latest	feb5d9fea6a5	5 weeks ago	13.3kB
busybox	<none>	16ea53ea7c65	6 weeks ago	1.24MB

Running With Extra Parameters

```
edds@ASUS-ROG-EDDS MINGW64 ~
$ docker run busybox echo "Hello world from Galileo Master!"
Hello world from Galileo Master!
```

Check Running Containers

```
edds@ASUS-ROG-EDDS MINGW64 ~
$ docker ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
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Check Stopped Containers

```
edds@ASUS-ROG-EDDS MINGW64 ~
$ docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
b572d0f6e23d	busybox	"echo 'Hello world f..."	2 minutes ago	Exited (0) 2 minutes ago		elega
nt_dirac	busybox	"sh"	3 minutes ago	Exited (0) 3 minutes ago		amazi
ng_bell	hello-world	"/hello"	15 minutes ago	Exited (0) 15 minutes ago		peace
ful_gould	jupyter/base-notebook	"tini -g -- start-no..."	2 weeks ago	Exited (0) 2 weeks ago		brave
38b91601932e	mysql:5.7.35	"docker-entrypoint.s..."	2 weeks ago	Exited (0) 2 weeks ago		heuri
_jang	mysql:5.7.35	"docker-entrypoint.s..."	2 weeks ago	Created		laugh
43965764b672	mysql:5.7.35	"docker-entrypoint.s..."	2 weeks ago	Created		bold_
stic_maxwell	mysql	"docker-entrypoint.s..."	2 weeks ago	Exited (0) 2 weeks ago		cool_
abba451cb0e8	mysql	"docker-entrypoint.s..."	2 weeks ago	Exited (0) 2 weeks ago		youth
ing_pare	jupyter/base-notebook	"tini -g -- start-no..."	2 weeks ago	Exited (0) 2 weeks ago		inter
9ef7a41fc4b8	mysql	"docker-entrypoint.s..."	2 weeks ago	Exited (0) 2 weeks ago		lucid
lamarr	mysql	"docker-entrypoint.s..."	2 weeks ago	Exited (0) 2 weeks ago		inter
aade28988b2	mysql	"docker-entrypoint.s..."	2 weeks ago	Exited (0) 2 weeks ago		lucid
murdock	mysql	"docker-entrypoint.s..."	2 weeks ago	Exited (0) 2 weeks ago		lucid
32bf82bae346	mysql	"docker-entrypoint.s..."	2 weeks ago	Exited (0) 2 weeks ago		lucid
ful_stonebraker	mysql	"docker-entrypoint.s..."	2 weeks ago	Exited (0) 2 weeks ago		lucid
add7df7b58eb	mysql	"docker-entrypoint.s..."	2 weeks ago	Exited (0) 2 weeks ago		lucid
_dubinsky	mysql	"docker-entrypoint.s..."	2 weeks ago	Exited (0) 2 weeks ago		lucid
2c0c3fe7e729	mysql	"docker-entrypoint.s..."	2 weeks ago	Exited (0) 2 weeks ago		lucid
esting_kirch	mysql	"docker-entrypoint.s..."	2 weeks ago	Exited (0) 2 weeks ago		lucid

Run and get inside the container

```
edds@ASUS-ROG-EDDSO MINGW64 ~
$ docker run -it busybox sh
/ # ls
bin dev etc home proc root sys tmp usr var
/ # uptime
00:38:13 up 25 min, 0 users, load average: 0.01, 0.00, 0.00
/ # exit
```

Delete Containers

```
edds@ASUS-ROG-EDDSO MINGW64 ~
$ docker rm 2c0c3fe7e729 add7df7b58eb
2c0c3fe7e729
add7df7b58eb

edds@ASUS-ROG-EDDSO MINGW64 ~
$ docker rm bold_lamarr
bold_lamarr
```

Verificando que se hayan borrado:

```
edds@ASUS-ROG-EDDSO MINGW64 ~
$ docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
c36f28a347df	busybox	"sh"	4 minutes ago	Exited (0) 2 minutes ago		serene_tharp
b572d0f6e23d	busybox	"echo 'Hello world f..."	14 minutes ago	Exited (0) 14 minutes ago		elegant_dirac
2fc7558d3176	busybox	"sh"	15 minutes ago	Exited (0) 15 minutes ago		amazing_bell
eb0206eaf115	hello-world	"/hello"	27 minutes ago	Exited (0) 27 minutes ago		peaceful_gould
38b91601932e	jupyter/base-notebook	"tini -g -- start-no..."	2 weeks ago	Exited (0) 2 weeks ago		brave_jang
43965764b672	mysql:5.7.35	"docker-entrypoint.s..."	2 weeks ago	Exited (0) 2 weeks ago		heuristic_maxwell
abba451cb0e8	mysql:5.7.35	"docker-entrypoint.s..."	2 weeks ago	Created		laughing_pare
aaeae28988b2	mysql	"docker-entrypoint.s..."	2 weeks ago	Exited (0) 2 weeks ago		cool_murdock
32bf82bae346	mysql	"docker-entrypoint.s..."	2 weeks ago	Exited (0) 2 weeks ago		youthful_stonebraker

Delete All

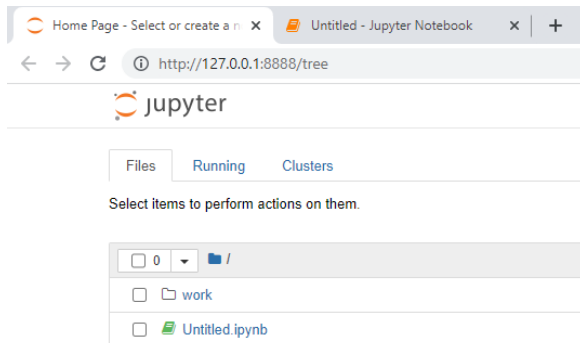
```
edds@ASUS-ROG-EDDSO MINGW64 ~
$ docker container prune
WARNING! This will remove all stopped containers.
Are you sure you want to continue? [y/N]
```

Docker and Python

Después de haber descargado la imagen de Jupyter Notebook se expone el puerto local al puerto del contenedor:

```
eddsq@ASUS-ROG-EDDSON MINGW64 ~
$ 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 00:50:34.052 NotebookApp] Writing notebook server cookie secret to /home/jovyan/.local/share/jupyter/runtime/notebook_cookie_secret
[W 2021-10-30 00:50:35.251 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 00:50:35.251 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 00:50:35.251 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 00:50:35.251 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 00:50:35.260 LabApp] JupyterLab extension loaded from /opt/conda/lib/python3.9/site-packages/jupyterlab
[I 2021-10-30 00:50:35.260 LabApp] JupyterLab application directory is /opt/conda/share/jupyter/lab
[I 00:50:35.266 NotebookApp] Serving notebooks from local directory: /home/jovyan
[I 00:50:35.267 NotebookApp] Jupyter Notebook 6.4.0 is running at:
[I 00:50:35.267 NotebookApp] http://0173e12e0e80:8888/?token=61ae25578503db248fce4a4c12d04f5f47a5a779eeb3be87
[I 00:50:35.267 NotebookApp] or http://127.0.0.1:8888/?token=61ae25578503db248fce4a4c12d04f5f47a5a779eeb3be87
[I 00:50:35.267 NotebookApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
[C 00:50:35.272 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://0173e12e0e80:8888/?token=61ae25578503db248fce4a4c12d04f5f47a5a779eeb3be87
or http://127.0.0.1:8888/?token=61ae25578503db248fce4a4c12d04f5f47a5a779eeb3be87
```



Con la versión 3.9.7:

```
In [2]: !python --version
Python 3.9.7

In [3]: !print('Hello World!')
Hello World!
```

Verificando que el contenedor está en ejecución:

```
eddsq@ASUS-ROG-EDDSON MINGW64 ~
$ docker ps
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS        PORTS                    NAMES
0173e12e0e80   jupyter/base-notebook  "tini -g -- start-no..." 6 minutes ago  Up 6 minutes  0.0.0.0:8888->8888/tcp  affectionate_elion
```

Create a Network

```
edds@ASUS-ROG-EDDS MINGW64 ~  
$ docker network create --driver bridge my_test_network_2  
580836c8ce31a73aa3f63856c0360e50008fcfb33cf63acb71850d55a067b36b
```

Definir variables de entorno y mapeo de puertos:

```
edds@ASUS-ROG-EDDS MINGW64 ~  
  
$ docker run -it --network my_test_network_2 -p 3305:3306 -e "MYSQL_ROOT_PASSWORD=root123" -e "MYSQL_DATABASE=test" -e  
"MYSQL_USER=test" -e "MYSQL_PASSWORD=test123" mysql:5.7.35  
  
2021-10-30 01:13:55+00:00 [Note] [Entrypoint]: Entrypoint script for MySQL Server 5.7.35-1debian10 started.  
2021-10-30 01:13:55+00:00 [Note] [Entrypoint]: Switching to dedicated user 'mysql'  
2021-10-30 01:13:55+00:00 [Note] [Entrypoint]: Entrypoint script for MySQL Server 5.7.35-1debian10 started.  
2021-10-30 01:13:55+00:00 [Note] [Entrypoint]: Initializing database files  
  
2021-10-30T01:13:55.473001Z 0 [Warning] TIMESTAMP with implicit DEFAULT value is deprecated. Please use  
--explicit_defaults_for_timestamp server option (see documentation for more details).  
2021-10-30T01:13:55.625865Z 0 [Warning] InnoDB: New log files created, LSN=45790  
2021-10-30T01:13:55.659234Z 0 [Warning] InnoDB: Creating foreign key constraint system tables.  
  
2021-10-30T01:13:55.666712Z 0 [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: a715c6b4-391e-11ec-810c-0242ac130003.  
2021-10-30T01:13:55.669082Z 0 [Warning] Gtid table is not ready to be used. Table 'mysql.gtid_executed'  
cannot be opened.  
  
2021-10-30T01:13:56.049702Z 0 [Warning] A deprecated TLS version TLSv1 is enabled. Please use TLSv1.2 or higher.  
2021-10-30T01:13:56.049732Z 0 [Warning] A deprecated TLS version TLSv1.1 is enabled. Please use TLSv1.2  
or higher.  
2021-10-30T01:13:56.050221Z 0 [Warning] CA certificate ca.pem is self signed.  
2021-10-30T01:13:56.207193Z 1 [Warning] root@localhost is created with an empty password ! Please consider switching off  
the --initialize-insecure option.  
  
2021-10-30 01:13:58+00:00 [Note] [Entrypoint]: Database files initialized  
2021-10-30 01:13:58+00:00 [Note] [Entrypoint]: Starting temporary server  
2021-10-30 01:13:58+00:00 [Note] [Entrypoint]: Waiting for server startup  
2021-10-30T01:13:58.798006Z 0 [Warning] TIMESTAMP with implicit DEFAULT value is deprecated. Please use  
--explicit_defaults_for_timestamp server option (see documentation for more details).  
2021-10-30T01:13:58.799510Z 0 [Note] mysqld (mysqld 5.7.35) starting as process 77 ...  
2021-10-30T01:13:58.802286Z 0 [Note] InnoDB: PUNCH HOLE support available  
2021-10-30T01:13:58.802313Z 0 [Note] InnoDB: Mutexes and rw_locks use GCC atomic builtins  
2021-10-30T01:13:58.802318Z 0 [Note] InnoDB: Uses event mutexes  
2021-10-30T01:13:58.802321Z 0 [Note] InnoDB: GCC builtin __atomic_thread_fence() is used for memory barrier  
2021-10-30T01:13:58.802324Z 0 [Note] InnoDB: Compressed tables use zlib 1.2.11  
2021-10-30T01:13:58.802326Z 0 [Note] InnoDB: Using Linux native AIO
```

```
2021-10-30T01:13:58.802573Z 0 [Note] InnoDB: Number of pools: 1
2021-10-30T01:13:58.802735Z 0 [Note] InnoDB: Using CPU crc32 instructions
2021-10-30T01:13:58.805459Z 0 [Note] InnoDB: Initializing buffer pool, total size = 128M, instances = 1, chunk size = 128M
2021-10-30T01:13:58.816706Z 0 [Note] InnoDB: Completed initialization of buffer pool
2021-10-30T01:13:58.819653Z 0 [Note] InnoDB: If the mysqld execution user is authorized, page cleaner thread priority can be changed. See the man page of setpriority().
2021-10-30T01:13:58.831847Z 0 [Note] InnoDB: Highest supported file format is Barracuda.
2021-10-30T01:13:58.839275Z 0 [Note] InnoDB: Creating shared tablespace for temporary tables
2021-10-30T01:13:58.839415Z 0 [Note] InnoDB: Setting file './ibtmp1' size to 12 MB. Physically writing the file full; Please wait ...
2021-10-30T01:13:58.854019Z 0 [Note] InnoDB: File './ibtmp1' size is now 12 MB.
2021-10-30T01:13:58.854413Z 0 [Note] InnoDB: 96 redo rollback segment(s) found. 96 redo rollback segment(s) are active.
2021-10-30T01:13:58.854477Z 0 [Note] InnoDB: 32 non-redo rollback segment(s) are active.
2021-10-30T01:13:58.856106Z 0 [Note] InnoDB: 5.7.35 started; log sequence number 2748489
2021-10-30T01:13:58.857557Z 0 [Note] InnoDB: Loading buffer pool(s) from /var/lib/mysql/ib_buffer_pool
2021-10-30T01:13:58.857727Z 0 [Note] Plugin 'FEDERATED' is disabled.
2021-10-30T01:13:58.859366Z 0 [Note] InnoDB: Buffer pool(s) load completed at 211030 1:13:58
2021-10-30T01:13:58.863995Z 0 [Note] Found ca.pem, server-cert.pem and server-key.pem in data directory. Trying to enable SSL support using them.
2021-10-30T01:13:58.864032Z 0 [Note] Skipping generation of SSL certificates as certificate files are present in data directory.
2021-10-30T01:13:58.864037Z 0 [Warning] A deprecated TLS version TLSv1 is enabled. Please use TLSv1.2 or higher.
2021-10-30T01:13:58.864039Z 0 [Warning] A deprecated TLS version TLSv1.1 is enabled. Please use TLSv1.2
or higher.
2021-10-30T01:13:58.864617Z 0 [Warning] CA certificate ca.pem is self signed.
2021-10-30T01:13:58.864670Z 0 [Note] Skipping generation of RSA key pair as key files are present in data directory.
2021-10-30T01:13:58.868142Z 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.
2021-10-30T01:13:58.874727Z 0 [Note] Event Scheduler: Loaded 0 events
2021-10-30T01:13:58.875056Z 0 [Note] mysqld: ready for connections.

Version: '5.7.35' socket: '/var/run/mysqld/mysqld.sock' port: 0 MySQL Community Server (GPL)
2021-10-30 01:13:59+00:00 [Note] [Entrypoint]: Temporary server started.

Warning: Unable to load '/usr/share/zoneinfo/iso3166.tab' as time zone. Skipping it.
Warning: Unable to load '/usr/share/zoneinfo/leap-seconds.list' as time zone. Skipping it.
Warning: Unable to load '/usr/share/zoneinfo/zone.tab' as time zone. Skipping it.
Warning: Unable to load '/usr/share/zoneinfo/zone1970.tab' as time zone. Skipping it.
2021-10-30 01:14:01+00:00 [Note] [Entrypoint]: Creating database test
2021-10-30 01:14:01+00:00 [Note] [Entrypoint]: Creating user test
2021-10-30 01:14:01+00:00 [Note] [Entrypoint]: Giving user test access to schema test
```

```
2021-10-30 01:14:01+00:00 [Note] [Entrypoint]: Stopping temporary server
2021-10-30T01:14:01.425636Z 0 [Note] Giving 0 client threads a chance to die gracefully
2021-10-30T01:14:01.425672Z 0 [Note] Shutting down slave threads
2021-10-30T01:14:01.425677Z 0 [Note] Forcefully disconnecting 0 remaining clients
2021-10-30T01:14:01.425681Z 0 [Note] Event Scheduler: Purging the queue. 0 events
2021-10-30T01:14:01.425745Z 0 [Note] Binlog end
2021-10-30T01:14:01.426117Z 0 [Note] Shutting down plugin 'ngram'
2021-10-30T01:14:01.426139Z 0 [Note] Shutting down plugin 'partition'
2021-10-30T01:14:01.426176Z 0 [Note] Shutting down plugin 'BLACKHOLE'
2021-10-30T01:14:01.426197Z 0 [Note] Shutting down plugin 'ARCHIVE'
2021-10-30T01:14:01.426216Z 0 [Note] Shutting down plugin 'PERFORMANCE_SCHEMA'
2021-10-30T01:14:01.426297Z 0 [Note] Shutting down plugin 'MRG_MYISAM'
2021-10-30T01:14:01.426322Z 0 [Note] Shutting down plugin 'MyISAM'
2021-10-30T01:14:01.426345Z 0 [Note] Shutting down plugin 'INNODB_SYS_VIRTUAL'
2021-10-30T01:14:01.426350Z 0 [Note] Shutting down plugin 'INNODB_SYS_DATAFILES'
2021-10-30T01:14:01.426353Z 0 [Note] Shutting down plugin 'INNODB_SYS_TABLESPACES'
2021-10-30T01:14:01.426355Z 0 [Note] Shutting down plugin 'INNODB_SYS_FOREIGN_COLS'
2021-10-30T01:14:01.426357Z 0 [Note] Shutting down plugin 'INNODB_SYS_FOREIGN'
2021-10-30T01:14:01.426359Z 0 [Note] Shutting down plugin 'INNODB_SYS_FIELDS'
2021-10-30T01:14:01.426361Z 0 [Note] Shutting down plugin 'INNODB_SYS_COLUMNS'
2021-10-30T01:14:01.426363Z 0 [Note] Shutting down plugin 'INNODB_SYS_INDEXES'
2021-10-30T01:14:01.426368Z 0 [Note] Shutting down plugin 'INNODB_SYS_TABLESTATS'
2021-10-30T01:14:01.426370Z 0 [Note] Shutting down plugin 'INNODB_SYS_TABLES'
2021-10-30T01:14:01.426372Z 0 [Note] Shutting down plugin 'INNODB_FT_INDEX_TABLE'
2021-10-30T01:14:01.426374Z 0 [Note] Shutting down plugin 'INNODB_FT_INDEX_CACHE'
2021-10-30T01:14:01.426392Z 0 [Note] Shutting down plugin 'INNODB_FT_CONFIG'
2021-10-30T01:14:01.426396Z 0 [Note] Shutting down plugin 'INNODB_FT_BEING_DELETED'
2021-10-30T01:14:01.426398Z 0 [Note] Shutting down plugin 'INNODB_FT_DELETED'
2021-10-30T01:14:01.426403Z 0 [Note] Shutting down plugin 'INNODB_FT_DEFAULT_STOPWORD'
2021-10-30T01:14:01.426405Z 0 [Note] Shutting down plugin 'INNODB_METRICS'
2021-10-30T01:14:01.426407Z 0 [Note] Shutting down plugin 'INNODB_TEMP_TABLE_INFO'
2021-10-30T01:14:01.426411Z 0 [Note] Shutting down plugin 'INNODB_BUFFER_POOL_STATS'
2021-10-30T01:14:01.426413Z 0 [Note] Shutting down plugin 'INNODB_BUFFER_PAGE_LRU'
2021-10-30T01:14:01.426433Z 0 [Note] Shutting down plugin 'INNODB_BUFFER_PAGE'
2021-10-30T01:14:01.426439Z 0 [Note] Shutting down plugin 'INNODB_CMP_PER_INDEX_RESET'
2021-10-30T01:14:01.426462Z 0 [Note] Shutting down plugin 'INNODB_CMP_PER_INDEX'
2021-10-30T01:14:01.426467Z 0 [Note] Shutting down plugin 'INNODB_CMPMEM_RESET'
2021-10-30T01:14:01.426471Z 0 [Note] Shutting down plugin 'INNODB_CMPMEM'
```

```
2021-10-30T01:14:01.426474Z 0 [Note] Shutting down plugin 'INNODB_CMP_RESET'
2021-10-30T01:14:01.426477Z 0 [Note] Shutting down plugin 'INNODB_CMP'
2021-10-30T01:14:01.426480Z 0 [Note] Shutting down plugin 'INNODB_LOCK_WAITS'
2021-10-30T01:14:01.426503Z 0 [Note] Shutting down plugin 'INNODB_LOCKS'
2021-10-30T01:14:01.426522Z 0 [Note] Shutting down plugin 'INNODB_TRX'
2021-10-30T01:14:01.426547Z 0 [Note] Shutting down plugin 'InnoDB'
2021-10-30T01:14:01.426656Z 0 [Note] InnoDB: FTS optimize thread exiting.
2021-10-30T01:14:01.426912Z 0 [Note] InnoDB: Starting shutdown...
2021-10-30T01:14:01.527237Z 0 [Note] InnoDB: Dumping buffer pool(s) to /var/lib/mysql/ib_buffer_pool
2021-10-30T01:14:01.527455Z 0 [Note] InnoDB: Buffer pool(s) dump completed at 211030 1:14:01
2021-10-30T01:14:02.843668Z 0 [Note] InnoDB: Shutdown completed; log sequence number 12665937
2021-10-30T01:14:02.845637Z 0 [Note] InnoDB: Removed temporary tablespace data file: "ibtmp1"
2021-10-30T01:14:02.845663Z 0 [Note] Shutting down plugin 'MEMORY'
2021-10-30T01:14:02.845668Z 0 [Note] Shutting down plugin 'CSV'
2021-10-30T01:14:02.845672Z 0 [Note] Shutting down plugin 'sha256_password'
2021-10-30T01:14:02.845674Z 0 [Note] Shutting down plugin 'mysql_native_password'
2021-10-30T01:14:02.845858Z 0 [Note] Shutting down plugin 'binlog'
2021-10-30T01:14:02.846589Z 0 [Note] mysqld: Shutdown complete

2021-10-30 01:14:03+00:00 [Note] [Entrypoint]: Temporary server stopped

2021-10-30 01:14:03+00:00 [Note] [Entrypoint]: MySQL init process done. Ready for start up.

2021-10-30T01:14:03.584868Z 0 [Warning] TIMESTAMP with implicit DEFAULT value is deprecated. Please use
--explicit_defaults_for_timestamp server option (see documentation for more details).
2021-10-30T01:14:03.586035Z 0 [Note] mysqld (mysqld 5.7.35) starting as process 1 ...
2021-10-30T01:14:03.588381Z 0 [Note] InnoDB: PUNCH HOLE support available
2021-10-30T01:14:03.588442Z 0 [Note] InnoDB: Mutexes and rw_locks use GCC atomic builtins
2021-10-30T01:14:03.588447Z 0 [Note] InnoDB: Uses event mutexes
2021-10-30T01:14:03.588450Z 0 [Note] InnoDB: GCC builtin __atomic_thread_fence() is used for memory barrier
2021-10-30T01:14:03.588468Z 0 [Note] InnoDB: Compressed tables use zlib 1.2.11
2021-10-30T01:14:03.588471Z 0 [Note] InnoDB: Using Linux native AIO
2021-10-30T01:14:03.588749Z 0 [Note] InnoDB: Number of pools: 1
2021-10-30T01:14:03.588880Z 0 [Note] InnoDB: Using CPU crc32 instructions
2021-10-30T01:14:03.590526Z 0 [Note] InnoDB: Initializing buffer pool, total size = 128M, instances = 1, chunk size =
128M
2021-10-30T01:14:03.614313Z 0 [Note] InnoDB: Completed initialization of buffer pool
2021-10-30T01:14:03.616576Z 0 [Note] InnoDB: If the mysqld execution user is authorized, page cleaner thread priority can
be changed. See the man page of setpriority().
```



```

2021-10-30T01:14:03.628401Z 0 [Note] InnoDB: Highest supported file format is Barracuda.
2021-10-30T01:14:03.636221Z 0 [Note] InnoDB: Creating shared tablespace for temporary tables
2021-10-30T01:14:03.636287Z 0 [Note] InnoDB: Setting file './ibtmp1' size to 12 MB. Physically writing the file full;
Please wait ...
2021-10-30T01:14:03.650511Z 0 [Note] InnoDB: File './ibtmp1' size is now 12 MB.
2021-10-30T01:14:03.650879Z 0 [Note] InnoDB: 96 redo rollback segment(s) found. 96 redo rollback segment(s) are active.
2021-10-30T01:14:03.650903Z 0 [Note] InnoDB: 32 non-redo rollback segment(s) are active.
2021-10-30T01:14:03.652241Z 0 [Note] InnoDB: 5.7.35 started; log sequence number 12665937
2021-10-30T01:14:03.652398Z 0 [Note] InnoDB: Loading buffer pool(s) from /var/lib/mysql/ib_buffer_pool
2021-10-30T01:14:03.652634Z 0 [Note] Plugin 'FEDERATED' is disabled.
2021-10-30T01:14:03.655907Z 0 [Note] InnoDB: Buffer pool(s) load completed at 211030 1:14:03
2021-10-30T01:14:03.658596Z 0 [Note] Found ca.pem, server-cert.pem and server-key.pem in data directory. Trying to enable
SSL support using them.
2021-10-30T01:14:03.658632Z 0 [Note] Skipping generation of SSL certificates as certificate files are present in data
directory.
2021-10-30T01:14:03.658638Z 0 [Warning] A deprecated TLS version TLSv1 is enabled. Please use TLSv1.2 or higher.
2021-10-30T01:14:03.658640Z 0 [Warning] A deprecated TLS version TLSv1.1 is enabled. Please use TLSv1.2
or higher.
2021-10-30T01:14:03.659396Z 0 [Warning] CA certificate ca.pem is self signed.
2021-10-30T01:14:03.659480Z 0 [Note] Skipping generation of RSA key pair as key files are present in data directory.
2021-10-30T01:14:03.660075Z 0 [Note] Server hostname (bind-address): '*'; port: 3306
2021-10-30T01:14:03.660201Z 0 [Note] IPv6 is available.
2021-10-30T01:14:03.660230Z 0 [Note] - '::' resolves to '::';
2021-10-30T01:14:03.660303Z 0 [Note] Server socket created on IP: '::'.
2021-10-30T01:14:03.663830Z 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.
2021-10-30T01:14:03.670198Z 0 [Note] Event Scheduler: Loaded 0 events
2021-10-30T01:14:03.670499Z 0 [Note] mysqld: ready for connections.

Version: '5.7.35' socket: '/var/run/mysqld/mysqld.sock' port: 3306 MySQL Community Server (GPL)

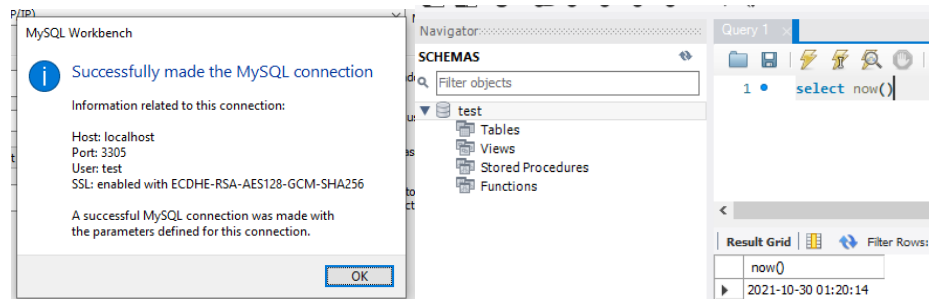
```

Verificar el contenedor y el mapeo de puertos:

```

edds@ASUS-ROG-EDDSON MINGW64 ~
$ docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS                               NAMES
e29be16badf8   mysql:5.7.35   "docker-entrypoint.s..."   About a minute ago   Up About a minute   33060/tcp, 0.0.0.0:3305->3306/tcp   sharp_almeida

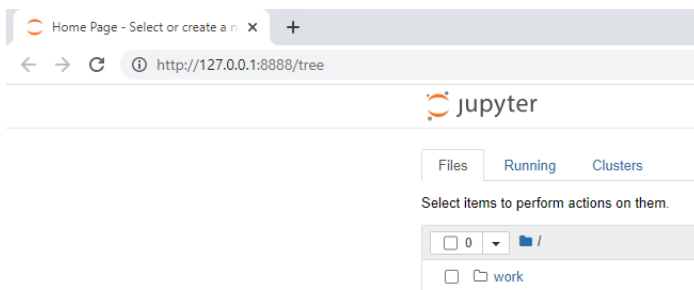
```



Ejecutar Jupyter dentro de la red creada:

```
eddsq@ASUS-ROG-EDDSO MINGW64 ~
$ docker run --network my_test_network_2 -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 01:25:04.223 NotebookApp] Writing notebook server cookie secret to /home/jovyan/.local/share/jupyter/runtime/notebook_cookie_secret
[W 2021-10-30 01:25:04.819 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 01:25:04.819 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 01:25:04.820 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 01:25:04.820 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 01:25:04.832 LabApp] JupyterLab extension loaded from /opt/conda/lib/python3.9/site-packages/jupyterlab
[I 2021-10-30 01:25:04.832 LabApp] JupyterLab application directory is /opt/conda/share/jupyter/lab
[I 01:25:04.839 NotebookApp] Serving notebooks from local directory: /home/jovyan
[I 01:25:04.839 NotebookApp] Jupyter Notebook 6.4.0 is running at:
[I 01:25:04.839 NotebookApp] http://7a68f778e61a:8888/?token=934aa7ec517962982618b27c85ec7f9c8fefa1207d45a393
[I 01:25:04.839 NotebookApp] or http://127.0.0.1:8888/?token=934aa7ec517962982618b27c85ec7f9c8fefa1207d45a393
[I 01:25:04.839 NotebookApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
[C 01:25:04.845 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://7a68f778e61a:8888/?token=934aa7ec517962982618b27c85ec7f9c8fefa1207d45a393
or http://127.0.0.1:8888/?token=934aa7ec517962982618b27c85ec7f9c8fefa1207d45a393
```



Verificando que los contenedores se están ejecutando:

```
eddsq@ASUS-ROG-EDDSO MINGW64 ~
$ docker ps
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS        PORTS                               NAMES
7a68f778e61a   jupyter/base-notebook   "jupyter-notebook"       About a minute   Up About a minute   0.0.0.0:8888->8888/tcp           gracious_ritchie
e29be16badf8   mysql:5.7.35          "docker-entrypoint.s..."  12 minutes ago   Up 12 minutes      33060/tcp, 0.0.0.0:3305->3306/tcp   sharp_almeida
```

Check Network

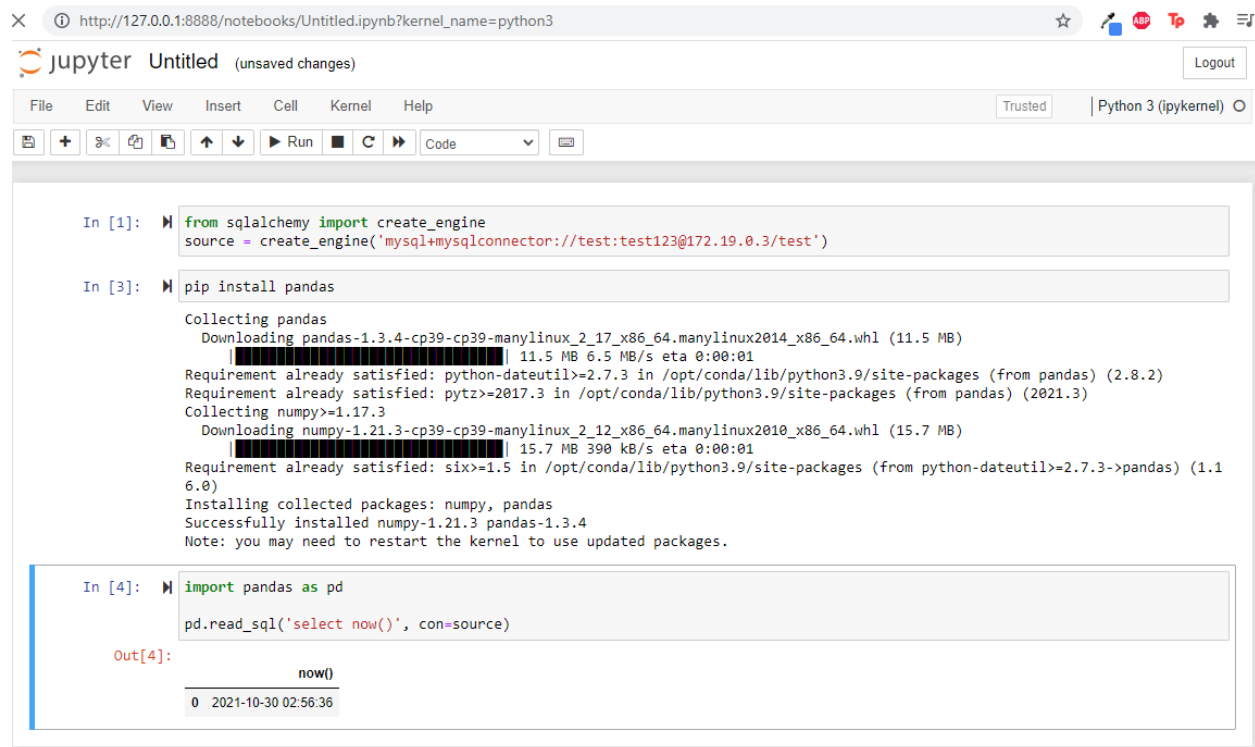
Utilizando el comando `docker network inspect my_test_network_2` se pueden ver las IP de los contenedores:

```
{
  "IPV6Address": "",
},
"7a68f778e61ab3eea4083ae9e5396c5ecf57d1be96cd340e6f8865a18112bc8e": {
  "Name": "gracious_ritchie",
  "EndpointID": "d8a1dddef77736d73919728bc6ceec0154c5833bf6b9f07627032cf4db90ad46",
  "MacAddress": "02:42:ac:13:00:04",
  "IPv4Address": "172.19.0.4/16",
  "IPv6Address": ""
},
"e29be16badf8bfc7e4b956512c359ccaa3dcf5450dcd78cb9ed72e1554cc6a": {
  "Name": "sharp_almeida",
  "EndpointID": "956ea1207f85c22db02343ef48d5c36b864f278159a681bd03be997773aaf5e6",
  "MacAddress": "02:42:ac:13:00:03",
  "IPv4Address": "172.19.0.3/16",
  "IPv6Address": ""
},
},
"Options": {},
"Labels": {}
}
```

Instalar mysql en Jupyter y hacer una consulta

```
edds@ASUS-ROG-EDDSON MINGW64 ~
$ docker exec -it gracious_ritchie sh
$ python --version
Python 3.9.7
$ pip --version
pip 21.2.4 from /opt/conda/lib/python3.9/site-packages/pip (python 3.9)
$ 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 2.6 MB/s
Collecting protobuf>=3.0.0
  Downloading protobuf-3.19.1-cp39-cp39-manylinux2014_x86_64.whl (1.1 MB)
    | 1.1 MB 2.7 MB/s
Installing collected packages: protobuf, mysql-connector-python
Successfully installed mysql-connector-python-8.0.27 protobuf-3.19.1
```

Finalmente, importamos pandas dentro de Jupyter y realizamos una consulta en la base de datos



The screenshot shows a Jupyter Notebook interface with the following content:

Browser address bar: http://127.0.0.1:8888/notebooks/Untitled.ipynb?kernel_name=python3

Jupyter Notebook: Untitled (unsaved changes) [Logout]

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

Code

```
In [1]: from sqlalchemy import create_engine
source = create_engine('mysql+mysqlconnector://test:test123@172.19.0.3/test')
```

```
In [3]: pip install pandas

Collecting pandas
  Downloading pandas-1.3.4-cp39-cp39-manylinux2014_x86_64.whl (11.5 MB)
    | 11.5 MB 6.5 MB/s eta 0:00:01
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-manylinux2010_x86_64.whl (15.7 MB)
    | 15.7 MB 390 kB/s eta 0:00:01
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 [4]: import pandas as pd

pd.read_sql('select now()', con=source)
```

Out[4]:

	now()
0	2021-10-30 02:56:36

Docker-Compose

Archivo yml que permite crear y ejecutar ambos contenedores en un solo paso:

```
docker-compose.yml x
docker-compose.yml
1  version: '3.7'
2
3  services:
4
5      db:
6          image: mysql:5.7.35
7          volumes:
8              - db_data:/var/lib/mysql
9          restart: always
10         ports:
11             - 3305:3306
12         environment:
13             MYSQL_ROOT_PASSWORD: test123
14             MYSQL_DATABASE: test
15             MYSQL_USER: test
16             MYSQL_PASSWORD: test123
17
18         jupyter:
19             image: jupyter/base-notebook
20             ports:
21                 - 8888:8888
22
23     volumes:
24         db_data:
25
```

Se ejecuta con: docker-compose up

```
eddsq@ASUS-ROG-EDDS0N MINGW64 ~/OneDrive/Maestria/product_development/Docker Compose (master)
$ docker-compose up
[+] Running 1/1
- Container docker-db-1 Created
Attaching to docker-db-1, docker-jupyter-1
docker-db-1 | 2021-10-30 03:43:08+00:00 [Note] [Entrypoint]: Entrypoint script for MySQL Serve
docker-db-1 | 2021-10-30 03:43:08+00:00 [Note] [Entrypoint]: Switching to dedicated user 'mysq
docker-db-1 | 2021-10-30 03:43:08+00:00 [Note] [Entrypoint]: Entrypoint script for MySQL Serve
docker-db-1 | 2021-10-30 03:43:08+00:00 [Note] [Entrypoint]: Initializing database files
docker-db-1 | 2021-10-30T03:43:08.273454Z 0 [Warning] TIMESTAMP with implicit DEFAULT value is
ls).
docker-db-1 | 2021-10-30T03:43:08.390522Z 0 [Warning] InnoDB: New log files created, LSN=45790
docker-jupyter-1 | WARN: Jupyter Notebook deprecation notice https://github.com/jupyter/docker-sta
docker-jupyter-1 | Executing the command: jupyter notebook
docker-db-1 | 2021-10-30T03:43:08.424167Z 0 [Warning] InnoDB: Creating foreign key constraint
```

Verificamos que los contenedores están activos:

```
eddsq@ASUS-ROG-EDDS0N MINGW64 ~/OneDrive/Maestria/product_development/Docker Compose (master)
$ docker ps
CONTAINER ID   IMAGE                COMMAND                  CREATED        STATUS        PORTS                               NAMES
479f5346ab88   mysql:5.7.35        "docker-entrypoint.s..." 2 minutes ago  Up 2 minutes  33060/tcp, 0.0.0.0:3305->3306/tcp  docker-db-1
31bb29548526   jupyter/base-notebook "tini -g -- start-no..." 2 minutes ago  Up 2 minutes  0.0.0.0:8888->8888/tcp           docker-jupyter-1
```

Finalmente, podemos instalar mysql y pandas en Jupyter y hacer la consulta a la base de datos (en este caso es más simple ya que no se necesita hacer una inspección de red ya que docker compose automáticamente le asigna un dominio a los contenedores).

```
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 3.8 MB/s eta 0:00:01
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 3.5 MB/s eta 0:00:01
Installing collected packages: protobuf, mysql-connector-python
Successfully installed mysql-connector-python-8.0.27 protobuf-3.19.1
Note: you may need to restart the kernel to use updated packages.
```

```
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 3.6 MB/s eta 0:00:01
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)
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 4.9 MB/s eta 0:00:01
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 [3]: from sqlalchemy import create_engine
```

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

```
In [4]: import pandas as pd
```

```
pd.read_sql('select now()', con=source)
```

```
Out[4]:
```

	now()
0	2021-10-30 03:59:48