UNIVERSIDAD TECNOLÓGICA DEL NORTE DE GUANAJUATO

Tecnologías de la Información y Comunicación
Programa educativo:

TSU en Infraestructura de Redes Digitales
Área académica:

Programación de Redes
Asignatura:

Unidad II: Introducción a REST API   **Grupo:** GIR0441

Docker and Python
Tarea:

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Docente:

Dolores Hidalgo, C.I.N., Gto., Martes 07 de Noviembre de 2022
Lugar y fecha:

Build your Python image

Aplicación de muestra:

```
german@vensor:~/python-docker$ python3 -m venv .venv
german@vensor:~/python-docker$ source .venv/bin/activate
(.venv) german@vensor:~/python-docker$ python3 -m pip install Flask
Collecting Flask
  Downloading Flask-2.2.2-py3-none-any.whl (101 kB)
                                        ━━━━━━━━━━━━━━━━━━━━━━━━ 101.5/101.5 KB 735.0 kB/s eta 0:00:00
Collecting Werkzeug>=2.2.2
  Downloading Werkzeug-2.2.2-py3-none-any.whl (232 kB)
                                        ━━━━━━━━━━━━━━━━━━━━━━━━ 232.7/232.7 KB 1.3 MB/s eta 0:00:00
Collecting Jinja2>=3.0
  Downloading Jinja2-3.1.2-py3-none-any.whl (133 kB)
                                        ━━━━━━━━━━━━━━━━━━━━━━━━ 133.1/133.1 KB 2.4 MB/s eta 0:00:00
Collecting click>=8.0
  Downloading click-8.1.3-py3-none-any.whl (96 kB)
                                        ━━━━━━━━━━━━━━━━━━━━━━━━ 96.6/96.6 KB 3.3 MB/s eta 0:00:00
Collecting itsdangerous>=2.0
  Downloading itsdangerous-2.1.2-py3-none-any.whl (15 kB)
Collecting MarkupSafe>=2.0
  Downloading MarkupSafe-2.1.1-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (25 kB)
Installing collected packages: MarkupSafe, itsdangerous, click, Werkzeug, Jinja2, Flask
Successfully installed Flask-2.2.2 Jinja2-3.1.2 MarkupSafe-2.1.1 Werkzeug-2.2.2 click-8.1.3 itsdangerous-2.1.2
(.venv) german@vensor:~/python-docker$ python3 -m pip freeze > requirements.txt
(.venv) german@vensor:~/python-docker$ touch app.py
```
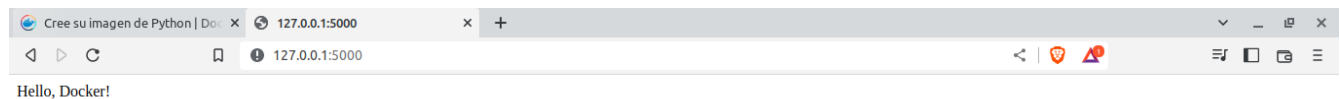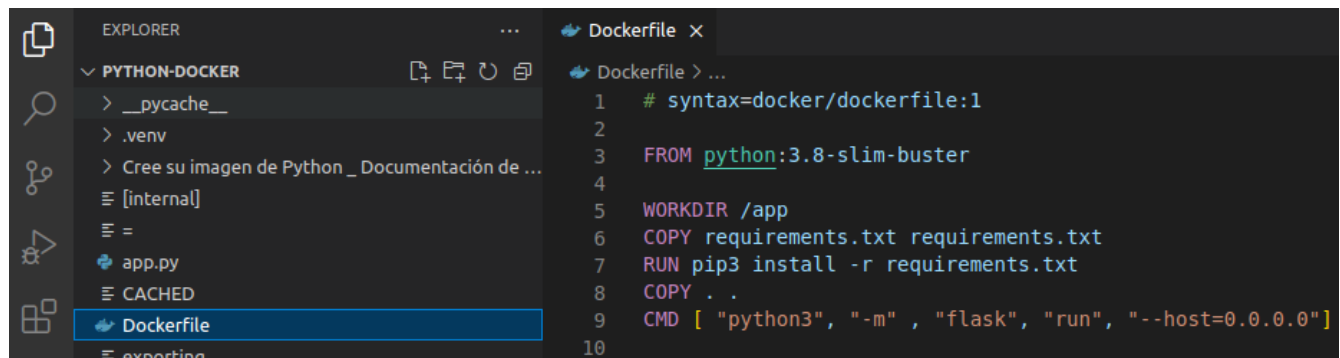
Código para manejar solicitudes web simples:

Prueba la aplicación:

```
(.venv) german@vensor:~/python-docker$ source .venv/bin/activate
(.venv) german@vensor:~/python-docker$ python3 -m flask run
 * Debug mode: off
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
 * Running on http://127.0.0.1:5000
Press CTRL+C to quit
127.0.0.1 - - [07/Nov/2022 17:20:58] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [07/Nov/2022 17:20:58] "GET /favicon.ico HTTP/1.1" 404 -
```

Hello, Docker!

Crea un Dockerfile para Python:

```
# syntax=docker/dockerfile:1

FROM python:3.8-slim-buster

WORKDIR /app
COPY requirements.txt requirements.txt
RUN pip3 install -r requirements.txt
COPY . .
CMD [ "python3", "-m" , "flask", "run", "--host=0.0.0.0"]
```

Construir una imagen:

```
^C(.venv) german@vensor:~/python-dockerdocker build --tag python-docker . .
[+] Building 2.7s (10/10) FINISHED
 => [internal] load build definition from Dockerfile
 => => transferring dockerfile: 203B
 => [internal] load .dockerignore
 => => transferring context: 2B
 => [internal] load metadata for docker.io/library/python:3.8-slim-buster
 => [1/6] FROM docker.io/library/python:3.8-slim-buster
 => [internal] load build context
 => => transferring context: 953B
 => CACHED [2/6] WORKDIR /app
 => [3/6] COPY requirements.txt requirements.txt
 => [4/6] RUN pip3 install -r requirements.txt
 => [5/6] COPY . .
 => [6/6] CMD [ "python3", "-m", "flask", "run", "--host=0.0.0.0"]
 => exporting to image
 => => exporting layers
 => => writing image sha256:8cae92a8fbd6d091ce687b71b31252056944b09760438905b726625831564c4c
 => => naming to docker.io/library/python-docker
```

Imágenes locales:

```
(.venv) german@vensor:~/python-docker$ docker images
REPOSITORY         TAG              IMAGE ID       CREATED              SIZE
python-docker      latest           dbfe83d2f02e   About a minute ago   149MB
<none>             <none>           31f2a8b06dbf   About a minute ago   149MB
python             3.8-slim-buster  d55c26ea3903   2 weeks ago          117MB
snyk/snyk          <none>           c3296d24f970   4 weeks ago          210MB
hello-world        latest           feb5d9fea6a5   13 months ago        13.3kB
```

Etiquetar imágenes:

```
(.venv) german@vensor:~/python-docker$ docker tag python-docker:latest python-docker:v1.0.0
(.venv) german@vensor:~/python-docker$ docker images
REPOSITORY         TAG              IMAGE ID       CREATED         SIZE
python-docker      latest           dbfe83d2f02e   2 minutes ago   149MB
python-docker      v1.0.0           dbfe83d2f02e   2 minutes ago   149MB
<none>             <none>           31f2a8b06dbf   3 minutes ago   149MB
python             3.8-slim-buster  d55c26ea3903   2 weeks ago     117MB
snyk/snyk          <none>           c3296d24f970   4 weeks ago     210MB
hello-world        latest           feb5d9fea6a5   13 months ago   13.3kB
```
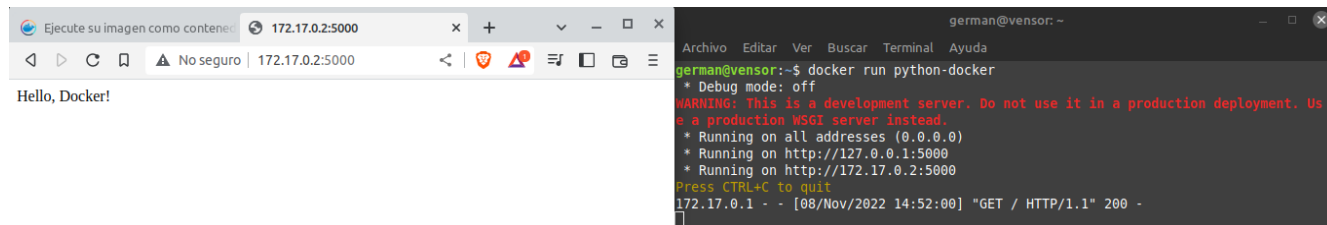
Borrar etiqueta de imágenes:

```
(.venv) german@vensor:~/python-docker$ docker rmi python-docker:v1.0.0
Untagged: python-docker:v1.0.0
Untagged: python-docker:v1.0.0
Untagged:: command not found
(.venv) german@vensor:~/python-docker$ docker images
REPOSITORY         TAG              IMAGE ID       CREATED         SIZE
python-docker      latest           dbfe83d2f02e   3 minutes ago   149MB
<none>             <none>           31f2a8b06dbf   4 minutes ago   149MB
python             3.8-slim-buster  d55c26ea3903   2 weeks ago     117MB
snyk/snyk          <none>           c3296d24f970   4 weeks ago     210MB
hello-world        latest           feb5d9fea6a5   13 months ago   13.3kB
```

Run your image as a container

Ejecutar imagen:

Solicitud GET al servidor:

```
german@vensor:~$ curl localhost:5000
curl: (7) Failed to connect to localhost port 5000 after 0 ms: Connection refused
```

Asignar puerto para cumplir con la solicitud y ejecutarlo:

```
^Cgerman@vensor:~$
german@vensor:~$ docker run --publish 8000:5000 python-docker
 * Debug mode: off
WARNING: This is a development server. Do not use it in a production deployment. Us
e a production WSGI server instead.
 * Running on all addresses (0.0.0.0)
 * Running on http://127.0.0.1:5000
 * Running on http://172.17.0.2:5000
Press CTRL+C to quit
```

Ejecutar en modo separado:

```
german@vensor:~$ docker run -d -p 8000:5000 python-docker
3da0a569680a19445195501404c30185731859bd5ce98053d5a474e0754d525f
```

```
german@vensor:~$ curl localhost:8000
Hello, Docker!german@vensor:~$
```

Lista de contenedores funcionando, y detener el contenedor **lucid_saha**:

```
german@vensor:~$ docker ps
CONTAINER ID   IMAGE          COMMAND             CREATED        STATUS        PORTS                                       NAMES
3da0a569680a   python-docker  "python3 -m flask ru…"  5 minutes ago  Up 5 minutes  0.0.0.0:8000->5000/tcp, :::8000->5000/tcp   lucid_saha
german@vensor:~$ docker stop lucid_saha
lucid_saha
german@vensor:~$ docker ps
CONTAINER ID   IMAGE     COMMAND    CREATED    STATUS     PORTS      NAMES
```

Detener, iniciar y nombrar contenedores:

```
german@vensor:~$ docker ps -a
CONTAINER ID   IMAGE          COMMAND              CREATED         STATUS                    PORTS       NAMES
3da0a569680a   python-docker  "python3 -m flask ru…"  7 minutes ago   Exited (137) About a minute ago         lucid_saha
13c664134436   python-docker  "python3 -m flask ru…"  10 minutes ago  Exited (0) 8 minutes ago                musing_cerf
493d37990bc8   python-docker  "python3 -m flask ru…"  12 minutes ago  Exited (0) 10 minutes ago               unruffled_taussig
99e29a42964d   python-docker  "python3 -m flask ru…"  14 minutes ago  Exited (0) 12 minutes ago               happy_albattani
af4533af66b1   python-docker  "python3 -m flask ru…"  14 minutes ago  Exited (0) 14 minutes ago               elegant_colden
6e2f267d4c40   python-docker  "python3 -m flask ru…"  16 minutes ago  Exited (0) 14 minutes ago               jovial_rhodes
7af040f02aef   python-docker  "python3 -m flask ru…"  18 minutes ago  Exited (0) 17 minutes ago               romantic_greider
96ab9025ac93   hello-world    "/hello"             5 days ago      Exited (0) 5 days ago                   vibrant_curran
german@vensor:~$ docker restart lucid_saha
lucid_saha
german@vensor:~$ docker ps --all
CONTAINER ID   IMAGE          COMMAND              CREATED         STATUS                    PORTS                                        NAMES
3da0a569680a   python-docker  "python3 -m flask ru…"  8 minutes ago   Up 13 seconds             0.0.0.0:8000->5000/tcp, :::8000->5000/tcp   lucid_saha
13c664134436   python-docker  "python3 -m flask ru…"  10 minutes ago  Exited (0) 8 minutes ago                                              musing_cerf
493d37990bc8   python-docker  "python3 -m flask ru…"  13 minutes ago  Exited (0) 10 minutes ago                                             unruffled_taussig
99e29a42964d   python-docker  "python3 -m flask ru…"  14 minutes ago  Exited (0) 13 minutes ago                                             happy_albattani
af4533af66b1   python-docker  "python3 -m flask ru…"  15 minutes ago  Exited (0) 14 minutes ago                                             elegant_colden
6e2f267d4c40   python-docker  "python3 -m flask ru…"  17 minutes ago  Exited (0) 15 minutes ago                                             jovial_rhodes
7af040f02aef   python-docker  "python3 -m flask ru…"  18 minutes ago  Exited (0) 17 minutes ago                                             romantic_greider
96ab9025ac93   hello-world    "/hello"             5 days ago      Exited (0) 5 days ago                                                 vibrant_curran
german@vensor:~$ docker stop lucid_saha
lucid_saha
german@vensor:~$ docker ps --all
CONTAINER ID   IMAGE          COMMAND              CREATED         STATUS                    PORTS       NAMES
3da0a569680a   python-docker  "python3 -m flask ru…"  9 minutes ago   Exited (137) 8 seconds ago              lucid_saha
13c664134436   python-docker  "python3 -m flask ru…"  11 minutes ago  Exited (0) 9 minutes ago                musing_cerf
493d37990bc8   python-docker  "python3 -m flask ru…"  13 minutes ago  Exited (0) 11 minutes ago               unruffled_taussig
99e29a42964d   python-docker  "python3 -m flask ru…"  15 minutes ago  Exited (0) 14 minutes ago               happy_albattani
af4533af66b1   python-docker  "python3 -m flask ru…"  15 minutes ago  Exited (0) 15 minutes ago               elegant_colden
6e2f267d4c40   python-docker  "python3 -m flask ru…"  18 minutes ago  Exited (0) 16 minutes ago               jovial_rhodes
7af040f02aef   python-docker  "python3 -m flask ru…"  19 minutes ago  Exited (0) 18 minutes ago               romantic_greider
96ab9025ac93   hello-world    "/hello"             5 days ago      Exited (0) 5 days ago                   vibrant_curran
```

Eliminar y nombrar contenedor:

```
german@vensor:~$ docker rm lucid_saha musing_cerf unruffled_taussig happy_albattani elegant_colden jovial_rhodes romantic_greider vibrant_curran
lucid_saha
musing_cerf
unruffled_taussig
happy_albattani
elegant_colden
jovial_rhodes
romantic_greider
vibrant_curran
german@vensor:~$ docker ps --all
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
german@vensor:~$ docker run -d -p 8000:5000 --name rest-server python-docker
c13fd669d40f9e2455c8d248fbb373715d1777d18e8ef138c8d3a74d3b7af367
german@vensor:~$ docker ps
CONTAINER ID   IMAGE          COMMAND              CREATED        STATUS        PORTS                                        NAMES
c13fd669d40f   python-docker  "python3 -m flask ru…"  9 seconds ago  Up 7 seconds  0.0.0.0:8000->5000/tcp, :::8000->5000/tcp   rest-server
```