

Docker task description.

Using docker lection2 create a docker image with Python Flask app that displays random cat pix.

Installing Docker:

```
student@student-VirtualBox:~$ sudo apt-get install \
> apt-transport-https \
> ca-certificates \
> curl \
> gnupg-agent \
> software-properties-common
```

```
student@student-VirtualBox:~$ curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo apt-key add -
OK
student@student-VirtualBox:~$ sudo apt-key fingerprint 0EBFCD88
pub   rsa4096 2017-02-22 [SCEA]
      9DC8 5822 9FC7 DD38 854A  E2D8 8D81 803C 0EBF CD88
uid           [ unknown] Docker Release (CE deb) <docker@docker.com>
sub   rsa4096 2017-02-22 [S]
```

```
student@student-VirtualBox:~$ sudo add-apt-repository \
> "deb [arch=amd64] https://download.docker.com/linux/ubuntu \
> $(lsb_release -cs) \
> stable"
```

```
student@student-VirtualBox:~$ sudo apt-get install docker-ce docker-ce-cli containerd.io
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  docker-buildx-plugin docker-ce-rootless-extras docker-compose-plugin git git-man liberror-perl pigz slirp4netns
Suggested packages:
  aufs-tools cgroupfs-mount | cgroup-lite git-daemon-run | git-daemon-sysvinit git-doc git-el git-email git-gui gitk gitweb git-cvs git-mediawiki git-svn
The following NEW packages will be installed:
  containerd.io docker-buildx-plugin docker-ce docker-ce-cli docker-ce-rootless-extras docker-compose-plugin git git-man liberror-perl pigz slirp4netns
0 upgraded, 11 newly installed, 0 to remove and 172 not upgraded.
Need to get 119 MB of archives.
After this operation, 453 MB of additional disk space will be used.
Do you want to continue? [Y/n]
```

Docker test:

```
student@student-VirtualBox:~$ sudo docker run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
719385e32844: Pull complete
Digest: sha256:dcba6daec718f547568c562956fa47e1b03673dd010fe6ee58ca806767031d1c
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/>

```
student@student-VirtualBox: ~/dockerfiles
GNU nano 4.8 Dockerfile
FROM python:3.8-slim
WORKDIR /dockerfiles
CMD ["python", "-c", "print('Hello, World!')"]
```

```
student@student-VirtualBox:~/dockerfiles$ sudo docker build -t tag .
[+] Building 38.7s (6/6) FINISHED
[internal] load build definition from Dockerfile
=> transferring dockerfile: 120B
[internal] load .dockerignore
=> transferring context: 2B
[internal] load metadata for docker.io/library/python:3.8-slim
[1/2] FROM docker.io/library/python:3.8-slimsha256:afe159e17a9fe37815ee00d55810e33ad59f12bb05c7bab247d46fd27a505f
=> resolve docker.io/library/python:3.8-slimsha256:afe159e17a9fe37815ee00d55810e33ad59f12bb05c7bab247d46fd27a505f
=> sha256:1b073f18021ce7b5267ae7af33f8372724e7bd2dd11d16da14255f3110c4b 6.97kB / 6.97kB
=> sha256:afe159e17a9fe37815ee00d55810e33ad59f12bb05c7bab247d46fd27a505f 1.80kB / 1.80kB
=> sha256:eb9d94fec90eef4f9b759b35d2f4fa4765157663a26ad642ae92d87a5037d5 1.37kB / 1.37kB
=> sha256:52d2b7f179e32b4cd579ee3c495802798bf9a8274850ab0c7c24661e3adaac5 29.12MB / 29.12MB
=> sha256:2b80a92248c1224b34f6aafbc3310f9a3fe65bd089305996d02eb0fc8326a9 3.50MB / 3.50MB
=> sha256:730b4d72731f13eecc315b4f780846f87e5f8cf31c4a02fbee3ddc4009922f 13.75MB / 13.75MB
=> sha256:dec829ef5502cc845f2092415eadd5b76a6b76456f15f96aa25a8d7d56d64ec1 243B / 243B
=> sha256:3bdcba9a760115e5491474931c905182054533d6d2680ed8d2ebf887a97ea7b3f 3.13MB / 3.13MB
=> extracting sha256:52d2b7f179e32b4cd579ee3c495802798bf9a8274850ab0c7c24661e3adaac5
=> extracting sha256:2b80a92248c1224b34f6aafbc3310f9a3fe65bd089305996d02eb0fc8326a9
=> extracting sha256:730b4d72731f13eecc315b4f780846f87e5f8cf31c4a02fbee3ddc4009922f
=> extracting sha256:dec829ef5502cc845f2092415eadd5b76a6b76456f15f96aa25a8d7d56d64ec1
=> extracting sha256:3bdcba9a760115e5491474931c905182054533d6d2680ed8d2ebf887a97ea7b3f
[2/2] WORKDIR /dockerfiles
=> exporting to image
=> exporting layers
=> writing image sha256:a61deb22edf0350c7c901ab33d7ad5b25c4613f8b8ac3dd165c94be59d1deaf
=> naming to docker.io/library/tag
student@student-VirtualBox:~/dockerfiles$
```

```
student@student-VirtualBox:~/dockerfiles$ sudo docker run tag
Hello, World!
```

Docker practice basics:

```
student@student-VirtualBox: ~/dockerfiles
GNU nano 4.8 Dockerfile
FROM ubuntu:20.04
RUN apt-get -y update
RUN apt-get -y install apache2
RUN echo 'Hi there, what is love?' > /var/www/html/index.html
RUN echo 'It is just a song ...' > /var/www/html/index.html
CMD ["/usr/sbin/apache2ctl", "-DFOREGROUND"]
EXPOSE 80
```

```
student@student-VirtualBox:~/dockerfiles$ sudo docker build -t new_tag .
[+] Building 108.3s (9/9) FINISHED
[internal] load build definition from Dockerfile
=> transferring dockerfile: 320B
[internal] load .dockerignore
=> transferring context: 2B
[internal] load metadata for docker.io/library/ubuntu:20.04
[40MB] [1/5] FROM docker.io/library/ubuntu:20.04sha256:33a5cc25d22c45900796a10ca487ad7a7cb09f09ea00b779e3b2026b4fc2faba
[2/5] RUN apt-get -y update
[3/5] RUN apt-get -y install apache2
[4/5] RUN echo 'Hi there, what is love?' > /var/www/html/index.html
[5/5] RUN echo 'It is just a song ...' > /var/www/html/index.html
=> exporting to image
=> exporting layers
=> writing image sha256:3c130b20d4ea22760bc21c455b099154b63020bab54f5356495aef65bf70db
=> naming to docker.io/library/new_tag
student@student-VirtualBox:~/dockerfiles$
```

```
student@student-VirtualBox:~/dockerfiles$ sudo docker images
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
new_tag       latest    3c130b20d4ea   2 minutes ago  232MB
tag           latest    a61deb22edf0   17 minutes ago 128MB
hello-world   latest    9c7a54a9a43c   3 months ago  13.3kB
```

```
student@student-VirtualBox:~/dockerfiles$ sudo docker run -d -p 7777:80 new_tag
7fbc3a56ab1cf7e605e25021b634e7195eadd9233d4a07633c82fe5cbc76db51
```

192.168.31.246:7777/ x +

← → ↺ 192.168.31.246:7777 ☆

It is just a song ...

```
student@student-VirtualBox:~/dockerfiles$ sudo docker stop 7fbc3a56ab1c
7fbc3a56ab1c
student@student-VirtualBox:~/dockerfiles$ sudo docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS        NAMES
```

```

student@student-VirtualBox:~/dockerfiles$ sudo docker system prune -a
WARNING! This will remove:
- all stopped containers
- all networks not used by at least one container
- all images without at least one container associated to them
- all build cache

Are you sure you want to continue? [y/N] y
Deleted Containers:
7fbc3a56ab1cf7e605e25021b634e7195eadd9233d4a07633c82fe5cbc76db51
36b347da7b9108b1feac6a6381d9d141cb877bc767ddd20d3ffff6f5a92a81591
94453b3c6e81be1fac7257f1635cc24c61fa4c247f3be916c4b6b8b6cb7829cf

Deleted Images:
untagged: hello-world:latest
untagged: hello-world@sha256:dcba6daec718f547568c562956fa47e1b03673dd010fe6ee58ca806767031d1c
deleted: sha256:9c7a54a9a43cca047013b82af109fe963fde787f63f9e016fdc3384500c2823d
deleted: sha256:01bb4fce3eb1b56b05adf99504dafd31907a5aadac736e36b27595c8b92f07f1
untagged: tag:latest
deleted: sha256:a61deb22edf0350c7c901ab33d7ad5b25c54613f8b8ac3dd165c94be59d1deaf
untagged: new_tag:latest
deleted: sha256:3c130b20d4ea22760bc21c455b899154b63020bab54f5356495aefef65bf70db

Deleted build cache objects:
lvhc2cptyy42a5efbk1ranwb1
oue0jb693d7kvybtwp3o1rltb
m5qj9c3q3cc16ori8rqvw55ea
opduzwcykl56apc2m6f2hkw73
j3475piis050wt6r9smnr6kjl
m6iv2df405u7wwxlxqrya6qtq
zpeidlymmc86ibxnx7x8qzl2i
tzvke5ic6w0byjyzilpf48h4p
r67n9g9aa7bjap351i2b1mbs0
gpucy6gythxfscx0u1qb3l3lw
ofsocc9ulfiu1u8c1iu8idpsu
ncsjf0diywje46yf3qoi80lh
o30q50hn7urfvd3jopqrkq92v
tqihippuktta87mbw6649nyjm

Total reclaimed space: 204.1MB
student@student-VirtualBox:~/dockerfiles$ sudo docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE

```

Creating flask-app:

```

student@student-VirtualBox:~/dockerfiles$ ls
Dockerfile  flask-app
student@student-VirtualBox:~/dockerfiles$ cd flask-app/
student@student-VirtualBox:~/dockerfiles/flask-app$ touch app.py
student@student-VirtualBox:~/dockerfiles/flask-app$ touch requirements.txt
student@student-VirtualBox:~/dockerfiles/flask-app$ mkdir templates
student@student-VirtualBox:~/dockerfiles/flask-app$ touch Dockerfile
student@student-VirtualBox:~/dockerfiles/flask-app$ ls
app.py  Dockerfile  requirements.txt  templates
student@student-VirtualBox:~/dockerfiles/flask-app$ cd templates/
student@student-VirtualBox:~/dockerfiles/flask-app/templates$ touch index.html
student@student-VirtualBox:~/dockerfiles/flask-app/templates$ cd ..

```

```

student@student-VirtualBox: ~/dockerfiles/flask-app
GNU nano 4.8                                app.py                                Modified
from flask import Flask, render_template
import random
app = Flask(__name__)
# list of cat images
images = [
    "http://ak-hdl.buzzfed.com/static/2013-10/enhanced/webdr05/15/9/anigif_enhanced-buzz-26388-1381844103-11.gif",
    "http://ak-hdl.buzzfed.com/static/2013-10/enhanced/webdr01/15/9/anigif_enhanced-buzz-31540-1381844535-8.gif",
    "http://ak-hdl.buzzfed.com/static/2013-10/enhanced/webdr05/15/9/anigif_enhanced-buzz-26390-1381844163-18.gif",
    "http://ak-hdl.buzzfed.com/static/2013-10/enhanced/webdr06/15/10/anigif_enhanced-buzz-1376-1381846217-0.gif",
    "http://ak-hdl.buzzfed.com/static/2013-10/enhanced/webdr03/15/9/anigif_enhanced-buzz-3391-1381844336-26.gif",
    "http://ak-hdl.buzzfed.com/static/2013-10/enhanced/webdr06/15/10/anigif_enhanced-buzz-29111-1381845968-0.gif",
    "http://ak-hdl.buzzfed.com/static/2013-10/enhanced/webdr03/15/9/anigif_enhanced-buzz-3409-1381844582-13.gif",
    "http://ak-hdl.buzzfed.com/static/2013-10/enhanced/webdr02/15/9/anigif_enhanced-buzz-19667-1381844937-10.gif",
    "http://ak-hdl.buzzfed.com/static/2013-10/enhanced/webdr05/15/9/anigif_enhanced-buzz-26358-1381845043-13.gif",
    "http://ak-hdl.buzzfed.com/static/2013-10/enhanced/webdr06/15/9/anigif_enhanced-buzz-18774-1381844645-6.gif",
    "http://ak-hdl.buzzfed.com/static/2013-10/enhanced/webdr06/15/9/anigif_enhanced-buzz-25158-1381844793-0.gif",
    "http://ak-hdl.buzzfed.com/static/2013-10/enhanced/webdr03/15/10/anigif_enhanced-buzz-11980-1381846269-1.gif"
]
@app.route('/')
def index():
    url = random.choice(images)
    return render_template("index.html", url=url)
if __name__ == "__main__":
    app.run(host='0.0.0.0')

```

```
student@student-VirtualBox: ~/dockerfiles/flask-app
GNU nano 4.8 Dockerfile Modified
# our base image
FROM alpine:3.5
# Install python and pip
RUN apk add --update py2-pip
# upgrade pip
RUN pip install --upgrade pip
# install Python modules needed by the Python app
COPY requirements.txt /usr/src/app/
RUN pip install --no-cache-dir -r /usr/src/app/requirements.txt
# copy files required for the app to run
COPY app.py /usr/src/app/
COPY templates/index.html /usr/src/app/templates/
# tell the port number the container should expose
EXPOSE 5000
# run the application
CMD ["python", "/usr/src/app/app.py"]

^G Get Help  ^O Write Out  ^W Where Is  ^K Cut Text  ^J Justify   ^C Cur Pos   M-U Undo     M-A Mark Text
^X Exit      ^R Read File  ^\ Replace   ^U Paste Text ^T To Spell  ^_ Go To Line M-E Redo     M-6 Copy Text
```

```
student@student-VirtualBox: ~/dockerfiles/flask-app/templates
GNU nano 4.8 index.html Modified
<html>
<head>
  <style type="text/css">
    body {
      background: black;
      color: white;
    }
    div.container {
      max-width: 500px;
      margin: 100px auto;
      border: 20px solid white;
      padding: 10px;
      text-align: center;
    }
    h4 {
      text-transform: uppercase;
    }
  </style>
</head>
<body>
  <div class="container">
    <h4>Cat Gif of the day</h4>
    
    <p><small>Courtesy: <a href="http://www.buzzfeed.com/copyranter/the-best-cat-gif-post-in-the-history-of-cat-gifs">Buzzfeed</a></small></p>
  </div>
</body>
</html>

^G Get Help  ^O Write Out  ^W Where Is  ^K Cut Text  ^J Justify   ^C Cur Pos   M-U Undo     M-A Mark Text  M-] To Bracket  M-Q Previous
^X Exit      ^R Read File  ^\ Replace   ^U Paste Text ^T To Spell  ^_ Go To Line M-E Redo     M-6 Copy Text  M-^ Where Was   M-W Next
```

```
student@student-VirtualBox: ~/dockerfiles/flask-app
GNU nano 4.8 requirements.txt Modified
task==0.10.1

^G Get Help  ^O Write Out  ^W Where Is  ^K Cut Text  ^J Justify   ^C Cur Pos   M-U Undo     M-A Mark Text  M-] To Bracket  M-Q Previous
^X Exit      ^R Read File  ^\ Replace   ^U Paste Text ^T To Spell  ^_ Go To Line M-E Redo     M-6 Copy Text  M-^ Where Was   M-W Next
```

```

student@student-VirtualBox:~/dockerfiles/flask-app$ docker build -t student/mycatapp .
[+] Building 39.2s (12/12) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 560B
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [internal] load metadata for docker.io/library/alpine:3.5
=> [1/7] FROM docker.io/library/alpine:3.5@sha256:66952b313e51c3bd1987d7c4ddf5dba9bc0fb6e524eed2448fa660246b3e76ec
=> => resolve docker.io/library/alpine:3.5@sha256:66952b313e51c3bd1987d7c4ddf5dba9bc0fb6e524eed2448fa660246b3e76ec
=> => sha256:66952b313e51c3bd1987d7c4ddf5dba9bc0fb6e524eed2448fa660246b3e76ec 433B / 433B
=> => sha256:f7d2b5725685826823bc6b154c0de02832e5e0daf7dc25a00ab00f1158fabfca 528B / 528B
=> => sha256:f80194ae2e0ccf0f098baa6b981396dfbffb16e476164af72158577a7de2dd9 1.51kB / 1.51kB
=> => sha256:8cae0e1ac61cead281f41115cc0ebd39117f7e54dff8fd5e05a7590dca3cd4e 1.97MB / 1.97MB
=> => extracting sha256:8cae0e1ac61cead281f41115cc0ebd39117f7e54dff8fd5e05a7590dca3cd4e
=> [internal] load build context
=> => transferring context: 2.38kB
=> [2/7] RUN apk add --update py2-pip
=> [3/7] RUN pip install --upgrade pip
=> [4/7] COPY requirements.txt /usr/src/app/
=> [5/7] RUN pip install --no-cache-dir -r /usr/src/app/requirements.txt
=> [6/7] COPY app.py /usr/src/app/
=> [7/7] COPY templates/index.html /usr/src/app/templates/
=> exporting to image
=> => exporting layers
=> => writing image sha256:cb96a59d2ab5fac331a78f516081c94068a561502af8ec62e7518052e5abdeca
=> => naming to docker.io/student/mycatapp
student@student-VirtualBox:~/dockerfiles/flask-app$

```

```

student@student-VirtualBox:~/dockerfiles/flask-app$ docker run -p 8888:5000 --name mycatapp student/mycatapp
* Running on http://0.0.0.0:5000/ (Press CTRL+C to quit)

```

