Simple Container Creation

Sanjana Sudarshan
Jetstream - Indiana University

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Docker

```
$ docker --version
```

```
Docker version 20.10.12, build 20.10.12-0ubuntu2~20.04.1
```

```
$ docker run hello-world
```

```
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
2db29710123e: Pull complete
Digest: sha256:13e367d31ae85359f42d637adf6da428f76d75dc9afeb3c21faea0d976f5c651
Status: Downloaded newer image for hello-world:latest


Hello from Docker!
This message shows that your installation appears to be working correctly.
```

Docker Commands

$ docker ps

```
CONTAINER ID   IMAGE              COMMAND                  CREATED   STATUS       PORTS              NAMES
bc069510bbd4   guacamole/guac..   "/opt/guacamole/bin/.."  8 min..   Up 8 min..   0.0.0.0:49528..    guacamole_exo..
62c072669b1c   guacamole/guac..   "/bin/sh -c '/usr/lo.."  8 min..   Up 8 min..   4822/tcp           guacamole_exo..
```

$ docker ps –a

```
CONTAINER ID   IMAGE              COMMAND                  CREATED   STATUS       PORTS              NAMES
2c4888d89a8f   hello-world        "/hello"                 11 min..  Exited (0) ..                   strange_swirles
bc069510bbd4   guacamole/guac..   "/opt/guacamole/bin/.."  8 min..   Up 8 min..   0.0.0.0:49528..    guacamole_exo..
62c072669b1c   guacamole/guac..   "/bin/sh -c '/usr/lo.."  8 min..   Up 8 min..   4822/tcp           guacamole_exo..
```

$ docker pull ubuntu

```
Using default tag: latest
latest: Pulling from library/ubuntu
405f018f9d1d: Pull complete
Digest: sha256:b6b83d3c331794420340093eb706a6f152d9c1fa51b262d9bf34594887c2c7ac
Status: Downloaded newer image for ubuntu:latest
docker.io/library/ubuntu:latest
```

Basic Commands (Contd.)

```
$ docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
rockylinux	latest	8cf70153e062	24 hours ago	196MB
almalinux	latest	4580d9e4bab7	35 hours ago	189MB
ubuntu	latest	27941809078c	4 weeks ago	77.8MB
alpine	latest	e66264b98777	6 weeks ago	5.53MB

```
$ docker run ubuntu
```

```
$ docker run ubuntu sleep 5
```

```
$ docker run –d ubuntu sleep 100
```

```
310cf3f5b9fef2ee78b2e44976026547feddd1907a8c42ccc9d513e26fbb1bfd
```

```
$ docker attach 310cf3f5b9
```

Dockerfile

Dockerfile

```
FROM ubuntu

RUN apt-get update && apt-get –y install python

COPY app.py /usr/src/app/

CMD [“python3” ,  “/usr/src/app/app.py”]
```

```
docker build Dockerfile –t $your_dockerhub_username/app-name
```

```
docker push $your_dockerhub_username/app-name
```

Build a Docker Image

Odd / Even

- app.py
- Dockerfile

$ cd ~ && mkdir simple-script && cd simple-script

app.py

```
# Python program to check if the input number is odd or even

num = int(input("Enter a number: "))
if (num % 2) == 0:
   print("{0} is Even".format(num))
else:
   print("{0} is Odd".format(num))
```

Build a Docker Image

Create a file called Dockerfile in the simple-script directory

```
# our base image
FROM alpine:3.9

# install python and pip
RUN apk add --update py3-pip

# copy files required for the app to run
COPY app.py /usr/src/app/

# run the application
CMD [“python3” ,  “/usr/src/app/app.py”]
```

$ docker build -t $YOUR_DOCKERHUB_USERNAME/simple-script .

```
sudo docker build -t sanjanasudarshan/simple-script .
Sending build context to Docker daemon  3.072kB
Step 1/4 : FROM alpine:3.9
3.9: Pulling from library/alpine
.
Step 2/4 : RUN apk add --update py3-pip
 ---> Running in ead201b4a5a9
fetch http://dl-cdn.alpinelinux.org/alpine/v3.9/main/x86_64/APKINDEX.tar.gz
fetch http://dl-cdn.alpinelinux.org/alpine/v3.9/community/x86_64/APKINDEX.tar.gz
(1/11) Installing libbz2 (1.0.6-r7)
.
(11/11) Installing python3 (3.6.9-r2)
Step 3/4 : COPY my_script.py /usr/src/app/
 ---> 3c12a3940c4d
Step 4/4 : CMD ["python3" "/usr/src/app/my_script.py"
 ---> Running in f84bfd09474a
Removing intermediate container f84bfd09474a
 ---> 514dbb79d853
Successfully built 514dbb79d853
Successfully tagged sanjanasudarshan/simple-script:latest
```

$ docker run -i $YOUR_DOCKERHUB_USERNAME/simple-script

```
Enter a number: 5
5 is Odd
```

Build a Docker Image

Dice Roll

- diceroll.py
- Dockerfile

$ cd ~ && mkdir dice-script && cd dice-script

diceroll.py

```
import random
min = 1
max = 6

roll_again = "yes”

while roll_again == "yes" or roll_again == "y":
   print "Rolling dice..."
   print "The values are...."
   print random.randint(min, max)
   print random.randint(min, max)

   roll_again = raw_input("Roll dice again?")
```

Dockerfile

```
# our base image
FROM alpine:3.9

# install python and pip
RUN apk add --update py3-pip

# copy files required for the app to run
COPY diceroll.py /usr/src/app/

# run the application
CMD [“python3” ,  “/usr/src/app/diceroll.py”]
```

Build a Docker Image

Jupyter Notebook

$ docker search jupyter

```
INDEX       NAME                                    DESCRIPTION
docker.io   docker.io/jupyter/datascience-notebook   Jupyter Notebook Data Science Stack from h...   664
docker.io   docker.io/jupyter/all-spark-notebook     Jupyter Notebook Python, Scala, R, Spark, ...   300
docker.io   docker.io/jupyterhub/jupyterhub         JupyterHub: multi-user Jupyter notebook se...   248
docker.io   docker.io/jupyter/scipy-notebook        Jupyter Notebook Scientific Python Stack f...   239
```

$ cd ~ && mkdir mynotebook && cd mynotebook

model.py

```
def introduce(name):
    return 'Hello ' + name
```

Dockerfile

```
# our base image
FROM jupyter/minimal-notebook

# copy files required for the model to work
 COPY model.py /home/jovyan/work/

# tell the port number the container should expose
EXPOSE 8888
```

$ docker build -t $YOUR_DOCKERHUB_USERNAME /mynotebook .

```
Step 1/3 : FROM jupyter/minimal-notebook
Trying to pull repository docker.io/jupyter/minimal-notebook ...
latest: Pulling from docker.io/jupyter/minimal-notebook
.
.
.
Status: Downloaded newer image for docker.io/jupyter/minimal-notebook:latest
 ---> b61382e30c1d
Step 2/3 : COPY model.py /home/jovyan/work/
 ---> 961a469fb881
Removing intermediate container 7a2ba5ef7f8c
Step 3/3 : EXPOSE 8888
 ---> Running in a4cd0615b004
 ---> f1c18e7b1fac
Removing intermediate container a4cd0615b004
Successfully built f1c18e7b1fac
```

$ docker images

REPOSITORY	TAG	IMAGE ID	..
sanjanasudarshan/mynotebook	latest	f1c18e7b1fac	..
sanjanasudarshan/simple-script	latest	ea8a273af483	..

$ docker run -p 8888:8888 $YOUR_DOCKERHUB_USERNAME/mynotebook

```
docker run -p 8888:8888 sanjanasudarshan/mynotebook
Executing the command: jupyter notebook
[I 16:22:57.132 NotebookApp] Writing notebook server cookie secret to /home/jovyan/. . .
[I 16:22:57.961 NotebookApp] JupyterLab extension loaded from /opt/conda/lib/python3.7/.
.
.
.
   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://577b35de6162:8888/?token=575733d74407ad1aefc7bdae50dba08aa97811675234bfb8
    or http://127.0.0.1:8888/?token=575733d74407ad1aefc7bdae50dba08aa97811675234bfb8
```