

Lab 4 – Dockerfile

Build docker image

Build dockercoins images

1. Clone the following dockercoins project from the remote repository :

<https://github.com/brahimhamdi/dockercoins>

```
vagrant@Manager:~/Lab4$ git clone https://github.com/brahimhamdi/dockercoins
Cloning into 'dockercoins'...
remote: Enumerating objects: 147, done.
remote: Counting objects: 100% (147/147), done.
remote: Compressing objects: 100% (105/105), done.
remote: Total 147 (delta 45), reused 136 (delta 34), pack-reused 0
Receiving objects: 100% (147/147), 146.78 KiB | 596.00 KiB/s, done.
Resolving deltas: 100% (45/45), done.
vagrant@Manager:~/Lab4$
vagrant@Manager:~/Lab4$ cd dockercoins/
vagrant@Manager:~/Lab4/dockercoins$ tree
.
├── hasher
│   ├── Dockerfile
│   └── hasher.rb
├── rng
│   ├── Dockerfile
│   └── rng.py
├── webui
│   ├── Dockerfile
│   ├── Dockerfile.old
│   └── files
│       ├── d3.min.js
│       ├── index.html
│       ├── jquery-1.11.3.min.js
│       ├── jquery.js
│       ├── rickshaw.min.css
│       └── rickshaw.min.js
└── webui.js
worker
├── Dockerfile
└── worker.py

5 directories, 15 files
vagrant@Manager:~/Lab4/dockercoins$
```

2. Describe all Dockerfiles in the project.

```

vagrant@Manager:~/Lab4/dockercoins$ cat hasher/Dockerfile
FROM ruby:alpine
MAINTAINER brahim.hamdi.consult@gmail.com
RUN apk add --update build-base curl
RUN gem install sinatra
RUN gem install thin
ADD hasher.rb /
CMD ["ruby", "hasher.rb"]
EXPOSE 80
HEALTHCHECK --interval=1s --timeout=2s --retries=3 --start-period=1s CMD curl http://localhost/ || exit 1
vagrant@Manager:~/Lab4/dockercoins$ cat rng/Dockerfile
FROM python:alpine
MAINTAINER brahim.hamdi.consult@gmail.com
RUN pip install Flask
COPY rng.py /
CMD ["python", "rng.py"]
EXPOSE 80
vagrant@Manager:~/Lab4/dockercoins$ cat worker/Dockerfile
FROM python:alpine
MAINTAINER brahim.hamdi.consult@gmail.com
RUN pip install redis
RUN pip install requests
COPY worker.py /
CMD ["python", "worker.py"]
vagrant@Manager:~/Lab4/dockercoins$ cat webui/Dockerfile
FROM node:lts-slim

# Needed for node 15+ see https://stackoverflow.com/a/65443098
WORKDIR /usr/app

RUN npm install express
RUN npm install redis
COPY files/ ./files/
COPY webui.js .
CMD ["node", "webui.js"]
EXPOSE 80
vagrant@Manager:~/Lab4/dockercoins$ 

```

3. Using Dockerfiles, build *hasher*, *rng* and *worker* images, and then test them.

```

vagrant@Manager:~/Lab4/dockercoins$ docker build -t hasher:v1 hasher/
[+] Building 146.2s (10/10) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 345B
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [internal] load metadata for docker.io/library/ruby:alpine
=> [1/5] FROM docker.io/library/ruby:alpine@sha256:1df6125b0f90e087123698e1b2df1c6a544a40033a5a14bfa3ef7067863d3474
=> => resolve docker.io/library/ruby:alpine@sha256:1df6125b0f90e087123698e1b2df1c6a544a40033a5a14bfa3ef7067863d3474
=> => sha256:f55a9173cc83d16fc9d2fa4714aafff4971f72582aeb1e4a7202d6f7dd4385c9 7.24kB / 7.24kB
=> => sha256:8a49fdb3b6a5ff2bd8ec6a86c05b2922a0f7454579ecc07637e94dfd1d0639b6 3.40MB / 3.40MB
=> => sha256:4d3d25e339e798c7606304d1a00cff7f31a5876c66dec58866278476db2c83ea 4.13MB / 4.13MB
=> => sha256:75dd67f3ccc89561ff13877120b513941dc1e14c5ab32c4ce6d5585ee6ef9189 226B / 226B
=> => sha256:1df6125b0f90e087123698e1b2df1c6a544a40033a5a14bfa3ef7067863d3474 1.65kB / 1.65kB
=> => sha256:a50add1892fefca47fd3ae12cd3cc96c125a855b3d3e759e04843466ef8a9e96 1.36kB / 1.36kB
=> => sha256:02e0073c722e2b5a6b75ca6815e02a7eea9507b8e6e7395cf1c1fa637f095277 31.82MB / 31.82MB
=> => extracting sha256:8a49fdb3b6a5ff2bd8ec6a86c05b2922a0f7454579ecc07637e94dfd1d0639b6
=> => sha256:2f6f0e03d5f788eb85649a5771828e072560f5bc56e7d65caeab2551be52aaf1 173B / 173B
=> => extracting sha256:4d3d25e339e798c7606304d1a00cff7f31a5876c66dec58866278476db2c83ea
=> => extracting sha256:75dd67f3ccc89561ff13877120b513941dc1e14c5ab32c4ce6d5585ee6ef9189
=> => extracting sha256:02e0073c722e2b5a6b75ca6815e02a7eea9507b8e6e7395cf1c1fa637f095277
=> => extracting sha256:2f6f0e03d5f788eb85649a5771828e072560f5bc56e7d65caeab2551be52aaf1
=> [internal] load build context
=> => transferring context: 315B
=> [2/5] RUN apk add --update build-base curl
=> [3/5] RUN gem install sinatra
=> [4/5] RUN gem install thin
=> [5/5] ADD hasher.rb /
=> exporting to image
=> => exporting layers
=> => writing image sha256:336a57c193e63c60741b53693b04a1d4cd9ea98c94f4626465cf69085a8ddeb7
=> => naming to docker.io/library/hasher:v1
vagrant@Manager:~/Lab4/dockercoins$ 

```

```
vagrant@Manager:~/Lab4/dockercoins$ docker build -t rng:v1 rng/
[+] Building 29.7s (8/8) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 181B
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [internal] load metadata for docker.io/library/python:alpine
=> [1/3] FROM docker.io/library/python:alpine@sha256:995c7fcd9a10e0e1a4555861dac63436b456822a167f07b6599d4f105de6f
=> => resolve docker.io/library/python:alpine@sha256:995c7fcd9a10e0e1a4555861dac63436b456822a167f07b6599d4f105de6f
=> => sha256:0357922e53aa8671e175f58d46bfd245908047b81e66370f634863785fe0c70e 622.30kB / 622.30kB
=> => sha256:a5c7ada51cb6c797e043633c2ea90da1031cc4fe9e2ca00d37dc967d82932d67 14.62MB / 14.62MB
=> => sha256:9ebc4081ccad9b1c9760ff3af0d3f6417798d0d72f56ecc8108611f60344afa8 241B / 241B
=> => sha256:995c7fcd9a10e0e1a4555861dac63436b456822a167f07b6599d4f105de6fa0 1.65kB / 1.65kB
=> => sha256:a6ee91afa87ebe042adf0820c83745855f895addd70dfe9cb1c1e4e8bb436c47 1.37kB / 1.37kB
=> => sha256:35f8462d36fe25f1117df6aa781567fe73dcd0796c859252c0894b1e308e27ce 6.26kB / 6.26kB
=> => sha256:839b27ab4d6651bf3819f976e92c30d5b00f6d0f4dc8779e82f04a1b4c88a1d0 3.09MB / 3.09MB
=> => extracting sha256:0357922e53aa8671e175f58d46bfd245908047b81e66370f634863785fe0c70e
=> => extracting sha256:a5c7ada51cb6c797e043633c2ea90da1031cc4fe9e2ca00d37dc967d82932d67
=> => extracting sha256:9ebc4081ccad9b1c9760ff3af0d3f6417798d0d72f56ecc8108611f60344afa8
=> => extracting sha256:839b27ab4d6651bf3819f976e92c30d5b00f6d0f4dc8779e82f04a1b4c88a1d0
=> [internal] load build context
=> => transferring context: 711B
=> [2/3] RUN pip install Flask
=> [3/3] COPY rng.py /
=> => exporting to image
=> => writing image sha256:f2d972dfef68b349bbb3999d41ef776fe172b185f393ce3b87ed50cfb398d2ba
=> => naming to docker.io/library/rng:v1
vagrant@Manager:~/Lab4/dockercoins$
```

```
vagrant@Manager:~/Lab4/dockercoins$ docker build -t worker:v1 worker/
[+] Building 14.6s (9/9) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 202B
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [internal] load metadata for docker.io/library/python:alpine
=> CACHED [1/4] FROM docker.io/library/python:alpine@sha256:995c7fcd9a10e0e1a4555861dac63436b456822a167f07b
=> [internal] load build context
=> => transferring context: 1.74kB
=> [2/4] RUN pip install redis
=> [3/4] RUN pip install requests
=> [4/4] COPY worker.py /
=> => exporting to image
=> => exporting layers
=> => writing image sha256:baae3122b8d9efb015fd16d8606a6d1d6aec346d46259ae7f234c4c21713aa08
=> => naming to docker.io/library/worker:v1
vagrant@Manager:~/Lab4/dockercoins$
```

```
vagrant@Manager:~/Lab4/dockercoins$ docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
webui	v1	87dfc182f7a4	20 seconds ago	255MB
worker	v1	baae3122b8d9	About a minute ago	74MB
rng	v1	f2d972dfef68	2 minutes ago	73.5MB
hasher	v1	336a57c193e6	3 minutes ago	324MB
wiki_app	1.0	489c71e694c0	2 hours ago	530MB
myapp	1.0	6f1d802ea830	2 hours ago	872kB
mariadb	latest	9a79847e85fb	6 days ago	403MB
wiki_db	1.0	6d799b508be0	6 days ago	403MB
nginx	latest	f9c14fe76d50	2 weeks ago	143MB

```
vagrant@Manager:~/Lab4/dockercoins$
```

```

vagrant@Manager:~/Lab4/dockercoins$ docker run -d --name hasher -p 8001:80 hasher:v1
10dacf30d3071ffc54214ae57d18e3d41400ca95f4c6f2a7c4193f0777ed5803
vagrant@Manager:~/Lab4/dockercoins$ docker run -d --name rng -p 8002:80 rng:v1
3e180b7da1f03e486ca847d24e62ed6e3df1b4dfe4a0cd07672e4f9cc3a23772
vagrant@Manager:~/Lab4/dockercoins$ docker run -d --name worker worker:v1
1efc2081cc31b2b5c77b0d8306e373d82ea04bb203e94ac2baf0f8e585ed9b50
vagrant@Manager:~/Lab4/dockercoins$ docker run -d --name webui -p 8000:80 webui:v1
d0e91dd0ada91355544078c50b5b2f183a61db4db394b3bdef3824819a7f2671
docker: Error response from daemon: driver failed programming external connectivity on endpoint webui (07d5ec77f4932dc0fd016565098c7d0
0ef395dfd906e4046c7aaaf38): Bind for 0.0.0.0:8000 failed: port is already allocated.
vagrant@Manager:~/Lab4/dockercoins$
vagrant@Manager:~/Lab4/dockercoins$ docker ps

```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
1efc2081cc31	worker:v1	"python worker.py"	20 seconds ago	Up 19 seconds		worker
3e180b7da1f0	rng:v1	"python rng.py"	35 seconds ago	Up 34 seconds	0.0.0.0:8002->80/tcp	rng
10dacf30d307	hasher:v1	"ruby hasher.rb"	52 seconds ago	Up 49 seconds (healthy)	0.0.0.0:8001->80/tcp	hasher

Push docker images to remote registry

4. Create an account in *hub.docker.com*/ registry.
5. Tags all images with your *DockerHub* username and push them to the registry.

```

Login with your Docker ID to push and pull images from Docker Hub. If you don't have a Docker ID, head over to https://hub.docker.com to create one.
Username: brahimhamdi
Password:
WARNING! Your password will be stored unencrypted in /home/vagrant/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
vagrant@Manager:~/Lab4/dockercoins$

```

```

vagrant@Manager:~/Lab4/dockercoins$ docker tag rng:v1 brahimhamdi/rng:v1
vagrant@Manager:~/Lab4/dockercoins$ docker images | grep rng
brahimhamdi/rng      v1      f2d972dfef68      17 minutes ago      73.5MB
rng                  v1      f2d972dfef68      17 minutes ago      73.5MB
vagrant@Manager:~/Lab4/dockercoins$ docker push brahimhamdi/rng:v1
The push refers to repository [docker.io/brahimhamdi/rng]
7127afb85374: Pushed
eb3cf7bfc4bd: Pushed
31215aa3e6ae: Mounted from brahimhamdi/worker
a3941c1792e9: Mounted from brahimhamdi/worker
3b5ed29797e6: Mounted from brahimhamdi/worker
208977ac81d7: Mounted from brahimhamdi/worker
bb01bd7e32b5: Mounted from brahimhamdi/worker
v1: digest: sha256:6e089049dbea3c609d2e1cf0ac99f604e64d901187856051387859b8d74d45cf size: 1786
vagrant@Manager:~/Lab4/dockercoins$
vagrant@Manager:~/Lab4/dockercoins$ docker tag hasher:v1 brahimhamdi/hasher:v1
vagrant@Manager:~/Lab4/dockercoins$ docker push brahimhamdi/hasher:v1
The push refers to repository [docker.io/brahimhamdi/hasher]
82626f01751e: Pushed
b274485c6630: Retrying in 1 second
b6c3f30e1b42: Retrying in 1 second
d6b082f1b7b6: Pushing [=====] 69.1MB/244.8MB
21a01cb926ce: Mounted from library/ruby
df22ccc42bc: Retrying in 4 seconds
ca7012631066: Retrying in 1 second
04dfbe480e06: Waiting
bb01bd7e32b5: Waiting
]

```

6. Delete locally all pushed images.


```
vagrant@Manager:~/Lab4/dockercoins$ docker rmi worker:v1 brahimhamdi/worker:v1 rng:v1 brahimhamdi/rng:v1 hasher:v1 brahimhamdi/hasher:v1
Untagged: worker:v1
Untagged: brahimhamdi/worker:v1
Untagged: brahimhamdi/worker@sha256:cdec595f62ed841ea806aa0251e866045d175e394fda17f9c9b2510398a4ecef
Deleted: sha256:baae3122b8d9efb015fd16d8606a6d1d6aec346d46259ae7f234c4c21713aa08
Untagged: rng:v1
Untagged: brahimhamdi/rng:v1
Untagged: brahimhamdi/rng@sha256:6e089049dbea3c609d2e1cf0ac99f604e64d901187856051387859b8d74d45cf
Deleted: sha256:f2d972dfe68b349bbb3999d41ef776fe172b185f393ce3b87ed50cfb398d2ba
Untagged: hasher:v1
Untagged: brahimhamdi/hasher:v1
Deleted: sha256:336a57c193e63c60741b53693b04a1d4cd9ea98c94f4626465cf69085a8ddebf
vagrant@Manager:~/Lab4/dockercoins$
```

7. Test pushed images.

```
vagrant@Manager:~/Lab4/dockercoins$ docker run -d --name worker brahimhamdi/worker:v1
Unable to find image 'brahimhamdi/worker:v1' locally
v1: Pulling from brahimhamdi/worker
8a49fdb3b6a5: Already exists
0357922e53aa: Already exists
a5c7ada51cb6: Already exists
9ebc4081ccad: Already exists
839b27ab4d66: Already exists
6c28a5a4585a: Already exists
53975e5528b9: Already exists
db752cca316c: Already exists
Digest: sha256:cdec595f62ed841ea806aa0251e866045d175e394fda17f9c9b2510398a4ecef
Status: Downloaded newer image for brahimhamdi/worker:v1
ab2d12bcf49fdca2100a7dc6778bd54901b3999818cabb6e70a9c973611f00a6
vagrant@Manager:~/Lab4/dockercoins$
vagrant@Manager:~/Lab4/dockercoins$ docker run -d --name rng -p 8001:80 brahimhamdi/rng:v1
Unable to find image 'brahimhamdi/rng:v1' locally
v1: Pulling from brahimhamdi/rng
8a49fdb3b6a5: Already exists
0357922e53aa: Already exists
a5c7ada51cb6: Already exists
9ebc4081ccad: Already exists
839b27ab4d66: Already exists
0f11e9dee518: Already exists
74b270a96ee8: Already exists
Digest: sha256:6e089049dbea3c609d2e1cf0ac99f604e64d901187856051387859b8d74d45cf
Status: Downloaded newer image for brahimhamdi/rng:v1
f2420c57adf790e8b5895b0b214ea7bf710959df81175974c451483aa2853b8c
vagrant@Manager:~/Lab4/dockercoins$ docker ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
f2420c57adf7	brahimhamdi/rng:v1	"python rng.py"	8 seconds ago	Up 7 seconds	0.0.0.0:8001->80/tcp	rng
ab2d12bcf49f	brahimhamdi/worker:v1	"python worker.py"	42 seconds ago	Up 41 seconds		worker

```
vagrant@Manager:~/Lab4/dockercoins$
```