

KIII Homework-2

Listing 3.1: Checking that the docker binary works

```
root@JONY-PC: /home/jony1l × Settings × + v
root@JONY-PC:/home/jony102# docker info
Client:
 Context: default
 Debug Mode: false
 Plugins:
  buildx: Docker Buildx (Docker Inc.)
    Version: v0.10.2
    Path: /usr/libexec/docker/cli-plugins/docker-buildx
  compose: Docker Compose (Docker Inc.)
    Version: v2.16.0
    Path: /usr/libexec/docker/cli-plugins/docker-compose
  scan: Docker Scan (Docker Inc.)
    Version: v0.23.0
    Path: /usr/libexec/docker/cli-plugins/docker-scan

Server:
 Containers: 0
  Running: 0
  Paused: 0
  Stopped: 0
 Images: 0
 Server Version: 23.0.1
 Storage Driver: overlay2
  Backing Filesystem: extfs
  Supports d_type: true
  Using metacopy: false
  Native Overlay Diff: true
  userxattr: false
 Logging Driver: json-file
 Cgroup Driver: cgroupfs
 Cgroup Version: 1
 Plugins:
  Volume: local
  Network: bridge host ipvlan macvlan null overlay
  Log: awslogs fluentd gcplogs gelf journald json-file local logentries splunk syslog
 Swarm: inactive
 Runtimes: io.containerd.runc.v2 runc
 Default Runtime: runc
 Init Binary: docker-init
 containerd version: 2456e983eb9e37e47538f59ea18f2043c9a73640
 runc version: v1.1.4-0-g5fd4c4d
 init version: de40ad0
 Security Options:
  seccomp
   Profile: builtin
 Kernel Version: 5.10.16.3-microsoft-standard-WSL2
 Operating System: Ubuntu 22.04.2 LTS
 OSType: linux
 Architecture: x86_64
 CPUs: 8
```

Listing 3.2: Running our first container

```
root@JONY-PC:/home/jony102# docker run -it ubuntu /bin/bash
Unable to find image 'ubuntu:latest' locally
latest: Pulling from library/ubuntu
76769433fd8a: Pull complete
Digest: sha256:2adef22367284330af9f832ffefb717c78239f6251d9d0f58de50b86229ed1427
Status: Downloaded newer image for ubuntu:latest
root@ee2440cff5f0:/# |
```

Working with our first container

```
root@ee2440cff5f0:/# hostname
ee2440cff5f0
root@ee2440cff5f0:/# cat /etc/hosts
127.0.0.1        localhost
::1             localhost ip6-localhost ip6-loopback
fe00::0         ip6-localnet
ff00::0         ip6-mcastprefix
ff02::1         ip6-allnodes
ff02::2         ip6-allrouters
172.17.0.2      ee2440cff5f0
root@ee2440cff5f0:/# hostname -I
172.17.0.2
root@ee2440cff5f0:/# ps -aux
USER          PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root           1   0.0  0.0   4620   3808 pts/0    Ss   12:11   0:00 /bin/bash
root          12   0.0  0.0   7056   1608 pts/0    R+   12:15   0:00 ps -aux
root@ee2440cff5f0:/# apt-get update; apt-get install vim
Get:1 http://archive.ubuntu.com/ubuntu jammy InRelease [270 kB]
Get:2 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
```

Listing 3.10: Listing Docker containers

```
root@JONY-PC:/home/jony102# docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS   NAMES
ee2440cff5f0   ubuntu   "/bin/bash"             21 minutes ago Exited (0) 13 minutes ago   compassionate_cartwright
root@JONY-PC:/home/jony102# |
```

Listing 3.11: Naming a container

```
root@JONY-PC:/home/jony102# docker run --name Lucy -it ubuntu /bin/bash
root@1ce5ec9cb1d3:/# exit
exit
root@JONY-PC:/home/jony102# docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS   NAMES
1ce5ec9cb1d3   ubuntu   "/bin/bash"             16 seconds ago Exited (0) 8 seconds ago   Lucy
ee2440cff5f0   ubuntu   "/bin/bash"             29 minutes ago Exited (0) 21 minutes ago   compassionate_cartwright
root@JONY-PC:/home/jony102# |
```

Listing 3.12: Starting a stopped container

Listing 3.14: Attaching to a running container

```
root@JONY-PC:/home/jony102# docker start Lucy
Lucy
root@JONY-PC:/home/jony102# docker attach Lucy
root@1ce5ec9cb1d3:/# |
```

Creating daemonized containers

```
root@JONY-PC:/home/jony102# docker run --name Jeff_dmn -d ubuntu /bin/sh -c "while
true; do echo My name is Jeff; sleep 1; done"
9d621e31bf7bc6e61ce7753688fdc71837c0d09a6c858943f3be274a62ce944a
root@JONY-PC:/home/jony102# docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS        NAMES
9d621e31bf7b   ubuntu   "/bin/sh -c 'while\nt..." 22 seconds ago Up 20 seconds           Jeff_dmn
root@JONY-PC:/home/jony102#
```

Listing 3.19: Fetching the logs of our daemonized container

Listing 3.20: Tailing the logs of our daemonized container

```
root@JONY-PC:/home/jony102# docker logs Jeff_dmn
My name is Jeff
My name is Jeff
My name is Jeff
My name is Jeff
My name is Jeff
My name is Jeff
My name is Jeff
My name is Jeff

root@JONY-PC:/home/jony102# docker logs --tail 5 Jeff_dmn
My name is Jeff
My name is Jeff
My name is Jeff
My name is Jeff
My name is Jeff
root@JONY-PC:/home/jony102#
```

Listing 3.23: Inspecting the processes of the daemonized container

```
root@JONY-PC:/home/jony102# docker top Jeff_dmn
UID          PID         PPID         C            STIME       TTY         TIME        CMD
root         2928        2908         0            13:49       ?           00:00:00    /bin/sh -c while true; do echo My name
e is Jeff; sleep 1; done
root         3120        2928         0            13:49       ?           00:00:00    sleep 1
```

Listing 3.25: The docker stats command

```
root@JONY-PC:/home/jony102# docker stats Jeff_dmn
CONTAINER ID   NAME      CPU %       MEM USAGE / LIMIT   MEM %     NET I/O     BLOCK I/O    PIDS
9d621e31bf7b   Jeff_dmn  0.00%      0B / 0B             0.00%     0B / 0B     0B / 0B      0
CONTAINER ID   NAME      CPU %       MEM USAGE / LIMIT   MEM %     NET I/O     BLOCK I/O    PIDS
9d621e31bf7b   Jeff_dmn  0.00%      0B / 0B             0.00%     0B / 0B     0B / 0B      0
CONTAINER ID   NAME      CPU %       MEM USAGE / LIMIT   MEM %     NET I/O     BLOCK I/O    PIDS
9d621e31bf7b   Jeff_dmn  0.00%      0B / 0B             0.00%     0B / 0B     0B / 0B      0
```

Listing 3.26: Running a background task inside a container

Listing 3.27: Running an interactive command inside a container

```
root@JONY-PC:/home/jony102# docker exec -d Jeff_dmn touch /etc/HI_Jeff.exe
root@JONY-PC:/home/jony102# docker exec -ti Jedd_dmn /bin/bash
Error response from daemon: No such container: Jedd_dmn
root@JONY-PC:/home/jony102# docker exec -ti Jeff_dmn /bin/bash
root@9d621e31bf7b:/# cd etc
root@9d621e31bf7b:/etc# ls -l
total 272
-rw-r--r-- 1 root root      0 Mar  7 13:06 HI_Jeff.exe
-rw-r--r-- 1 root root 3028 Mar  1 02:03 adduser.conf
```

Listing 3.28: Stopping the running Docker container

```
root@JONY-PC:/home/jony102# docker stop Jeff_dmn
Jeff_dmn
root@JONY-PC:/home/jony102# |
```

Automatic container restarts

```
root@JONY-PC:/home/jony102# docker run --restart=on-failure:7 --name Marry_dmn -d ubuntu /bin/sh -c "while true;do echo I'm here;sleep 10; done"
6d673d9c37df9befd7fdb397e6fb4a6a3d8aa0c7a840f3f860b56a0df26e027e
root@JONY-PC:/home/jony102# |
```

Listing 3.32: Inspecting a container

```
root@JONY-PC:/home/jony102# docker inspect Marry_dmn
[
  {
    "Id": "df9f71c14d93abf701320e722013bd3c8a5763503ac2fee3cbc0a2b1a5380a2d",
    "Created": "2023-03-07T13:30:14.408335455Z",
    "Path": "/bin/sh",
    "Args": [
      "-c",
      "while true;do echo I am here;sleep 10; done"
    ],
    "State": {
      "Status": "running",
      "Running": true,
      "Paused": false,
      "Restarting": false,
      "OOMKilled": false,
      "Dead": false,
      "Pid": 6909,
      "ExitCode": 0,
      "Error": "",
      "StartedAt": "2023-03-07T13:30:14.755363683Z",
      "FinishedAt": "0001-01-01T00:00:00Z"
    },
    "Image": "sha256:74f2314a03de34a0a2d552b805411fc9553a02ea71c1291b815b2f645f565683",
  }
]
```

Listing 3.33: Selectively inspecting a container

```
root@JONY-PC:/home/jony102# docker inspect --format='{{ .State.Running }}' Marry_dmn
true
root@JONY-PC:/home/jony102# docker inspect --format='{{ .NetworkSettings.IPAddress }}' Marry_dmn
172.17.0.2
root@JONY-PC:/home/jony102# docker inspect --format='{{ .Name }} {{ .State.Running }}' Marry_dmn
/Marry_dmn true
root@JONY-PC:/home/jony102# |
```

Listing 3.36: Deleting a container

Listing 3.37: Deleting all containers

```
root@JONY-PC:/home/jony102# docker rm Jeff_dmn
Jeff_dmn
root@JONY-PC:/home/jony102# docker rm -f `docker ps -a -q`
df9f71c14d93
1ce5ec9cb1d3
ee2440cff5f0
root@JONY-PC:/home/jony102# docker ps
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
root@JONY-PC:/home/jony102# docker ps -a
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
root@JONY-PC:/home/jony102# |
```

Listing 4.1: Revisiting running a basic Docker container

```
root@JONY-PC:/home/jony102# docker run -it --name Jessica ubuntu /bin/bash
root@c3cbcc845077:/# |
```

Listing 4.2: Listing Docker images

```
root@JONY-PC:/home/jony102# docker images
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
ubuntu        latest    74f2314a03de   6 days ago    77.8MB
root@JONY-PC:/home/jony102# |
```

Listing 4.3: Pulling the Ubuntu 20.04 image

Listing 4.4: Listing the ubuntu Docker images

```
root@JONY-PC:/home/jony102# docker pull ubuntu:20.04
20.04: Pulling from library/ubuntu
47c764472391: Pull complete
Digest: sha256:9fa30fcef427e5e88c76bc41ad37b7cc573e1d79cecb23035e413c4be6e476ab
Status: Downloaded newer image for ubuntu:20.04
docker.io/library/ubuntu:20.04
root@JONY-PC:/home/jony102# docker images
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
ubuntu        20.04     61c45d0e9798   6 days ago    72.8MB
ubuntu        latest    74f2314a03de   6 days ago    77.8MB
root@JONY-PC:/home/jony102# |
```

Listing 4.5: Running a tagged Docker image

```
root@JONY-PC:/home/jony102# docker run -it --name Cassie ubuntu:20.04 /bin/bash
root@2bad13ed1cb3:/# |
```

Listing 4.7: Pulling the fedora image

Listing 4.8: Viewing the fedora image

```
root@JONY-PC:/home/jony102# docker pull fedora:21
21: Pulling from library/fedora
fced6e4a4c06: Pull complete
Digest: sha256:a268e5e12257c7770eb44c24041baf5e728fba2eed1a84f007b81845ded0a485
Status: Downloaded newer image for fedora:21
docker.io/library/fedora:21
root@JONY-PC:/home/jony102# docker images fedora
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
fedora        21        ba6369d667d1   6 years ago    241MB
root@JONY-PC:/home/jony102# |
```

Listing 4.10: Searching for images

```
root@JONY-PC:/home/jony102# docker search python
```

NAME	DESCRIPTION	STARS	OFFICIAL	AUTOMATED
python	Python is an interpreted, interactive, objec...	8494	[OK]	
pypy	PyPy is a fast, compliant alternative implem...	358	[OK]	
hyang	Hy is a Lisp dialect that translates express...	54	[OK]	
circleci/python	Python is an interpreted, interactive, objec...	63		
bitnami/python	Bitnami Python Docker Image	25		[OK]
cimg/python		6		

Listing 4.11: Pulling down the jamtur01/puppetmaster image

Listing 4.12: Creating a Docker container from the puppetmaster image

```
root@JONY-PC:/home/jony102# docker pull jamtur01/puppetmaster
Using default tag: latest
latest: Pulling from jamtur01/puppetmaster
Image docker.io/jamtur01/puppetmaster:latest uses outdated schema1 manifest format. Please upgrade to a schema2 image for better future compatibility. More information at https://docs.docker.com/registry/spec/deprecated-schema-v1/
a3ed95caeb02: Pull complete
6e71c889542e: Pull complete
d196a7609355: Pull complete
08f6dfff5acea: Pull complete
ce65532003d0: Pull complete
d1f76d0972bd: Pull complete
c9ed023cc2c9: Pull complete
Digest: sha256:2eedcf4cbe50f7052b420b2b125969873872d76ce36752f04f5160160acd1258
Status: Downloaded newer image for jamtur01/puppetmaster:latest
docker.io/jamtur01/puppetmaster:latest
root@JONY-PC:/home/jony102# docker run -it --name Puppy jamtur01/puppetmaster /bin/bash
root@3965ed772f01:/# puppet
See 'puppet help' for help on available puppet subcommands
root@3965ed772f01:/# puppet --version
3.4.3
root@3965ed772f01:/# facter
architecture => amd64
augeasversion => 1.2.0
blockdevice_sda_model => Virtual Disk
blockdevice_sda_size => 27487796944
blockdevice_sda_vendor => Msft
blockdevice_sdb_model => Virtual Disk
blockdevice_sdb_size => 27487796944
```

Listing 4.13: Logging into the Docker Hub

```
root@JONY-PC:/home/jony102# docker login
Login with your Docker ID to push and pull images from Docker Hub. If you don't have a Docker ID,
ub.docker.com to create one.
Username: andre102
Password:
WARNING! Your password will be stored unencrypted in /root/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
root@JONY-PC:/home/jony102# |
```

Listing 4.14: Creating a custom container to modify

Listing 4.15: Adding the Apache package

```
root@JONY-PC:/home/jony102# docker run -it --name Nat ubuntu /bin/bash
root@c863321d7ef3:/# apt-get -yqq update
root@c863321d7ef3:/# apt-get -y install apache2
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
```

Listing 4.16: Committing the custom container

Listing 4.17: Reviewing our new image

```
root@JONY-PC:/home/jony102# docker commit Nat andre102/nat_apache2
sha256:732a33e9c77e07e93cc84b2a5a52dbaede77ecd8a79b850a5603ca8bc500d7e2
root@JONY-PC:/home/jony102# docker images
REPOSITORY          TAG          IMAGE ID          CREATED           SIZE
andre102/nat_apache2 latest       732a33e9c77e     About a minute ago 228MB
ubuntu              20.04       61c45d0e9798     7 days ago       72.8MB
```

Listing 4.18: Committing another custom container

Listing 4.19: Inspecting our committed image

```
root@JONY-PC:/home/jony102# docker commit -m "New apache image" -a "Andrej Bardakoski 201149" Nat andre102/nat_apache2:NewTag
sha256:a0936b0135d96ba07bbc1f78d56cd1764846e3fb74f2018c32d7572d01a0c94c
root@JONY-PC:/home/jony102# docker inspect andre102/nat_apache2:NewTag
[]
Error: No such object: andre102/nat_apache2:NewTag
root@JONY-PC:/home/jony102# docker inspect andre102/nat_apache2:NewTag
[
  {
    "Id": "sha256:a0936b0135d96ba07bbc1f78d56cd1764846e3fb74f2018c32d7572d01a0c94c",
    "RepoTags": [
      "andre102/nat_apache2:NewTag"
    ],
    "RepoDigests": [],
    "Parent": "sha256:74f2314a03de34a0a2d552b805411fc9553a02ea71c1291b815b2f645f565683",
    "Comment": "New apache image ",
    "Created": "2023-03-08T18:00:03.201658441Z",
    "Container": "1-86323147a-f303231f40a-10ba520a305741231f60-05f07b0b410023-0-0031"
```

Listing 4.20: Running a container from our committed image

```
root@JONY-PC:/home/jony102# docker run -ti andre102/nat_apache2:NewTag /bin/bash
root@9c162c0df67a:/# service apache2 status
* apache2 is not running
root@9c162c0df67a:/#
```

Listing 4.21: Creating a sample repository

```
root@JONY-PC:/home/jony102# mkdir kiii-homework_2
root@JONY-PC:/home/jony102# cd kiii-homework_2
root@JONY-PC:/home/jony102/kiii-homework_2# mkdir docker_static_web
root@JONY-PC:/home/jony102/kiii-homework_2# cd docker_static_web/
root@JONY-PC:/home/jony102/kiii-homework_2/docker_static_web# nano Dockerfile
root@JONY-PC:/home/jony102/kiii-homework_2/docker_static_web#
```

Listing 4.22: Our first Dockerfile

```
GNU nano 6.2 Dockerfile *
# Version: 0.0.1
FROM ubuntu:20.04
LABEL maintainer="andrej.bardakoski@students.finki.ukim.mk"
RUN apt-get update; apt-get install -y nginx
RUN echo 'Hello World <3<3<3 ' >/var/www/html/index.html
EXPOSE 80
```

Listing 4.24: Running the Dockerfile

```
root@JONY-PC:/home/jony102/kiii-homework_2/docker_static_web# docker build -t="andre102/docker_static_web" .
[+] Building 24.5s (7/7) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 247B
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [internal] load metadata for docker.io/library/ubuntu:20.04
=> [1/3] FROM docker.io/library/ubuntu:20.04
=> [2/3] RUN apt-get update; apt-get install -y nginx
=> [3/3] RUN echo 'Hello World <3<3<3 ' >/var/www/html/index.html
=> exporting to image
=> => exporting layers
=> => writing image sha256:fb5db0b7e4c52a56f0dd9ef3c0d19ae835a4c47f29176c8281529a72faa6b78a
=> => naming to docker.io/andre102/docker_static_web
root@JONY-PC:/home/jony102/kiii-homework_2/docker_static_web#
```


Listing 4.25: Tagging a build

```
root@JONY-PC:/home/jony102/kiii-homework_2/docker_static_web# docker build -t="andre102/docker_static_web":Release .
[+] Building 0.0s (7/7) FINISHED
=> [internal] load .dockerignore                                0.0s
=> => transferring context: 2B                                  0.0s
=> [internal] load build definition from Dockerfile            0.0s
=> => transferring dockerfile: 247B                             0.0s
=> [internal] load metadata for docker.io/library/ubuntu:20.04 0.0s
=> [1/3] FROM docker.io/library/ubuntu:20.04                 0.0s
=> CACHED [2/3] RUN apt-get update; apt-get install -y nginx  0.0s
=> CACHED [3/3] RUN echo 'Hello World <3<3<3 ' >/var/www/html/index.html 0.0s
=> exporting to image                                          0.0s
=> => exporting layers                                          0.0s
=> => writing image sha256:fb5db0b7e4c52a56f0dd9ef3c0d19ae835a4c47f29176c8281529a72faa6b78a 0.0s
=> => naming to docker.io/andre102/docker_static_web:Release 0.0s
root@JONY-PC:/home/jony102/kiii-homework_2/docker_static_web#
```

Listing 4.26: Building from a Git repository

```
root@JONY-PC:/home/jony102/kiii-homework_2/docker_static_web# docker build -t="andre102/static_web_git:V1.0.0" \
> github.com/turnbullpress/docker-static_web
[+] Building 38.2s (7/7) FINISHED
=> [internal] load git source github.com/turnbullpress/docker-static_web 3.0s
=> [internal] load metadata for docker.io/library/ubuntu:16.04 3.9s
=> [auth] library/ubuntu:pull token for registry-1.docker.io 0.0s
=> [1/3] FROM docker.io/library/ubuntu:16.04@sha256:1f1a2d56de1d604801a9671f301190704c25d604a416f59e03c04f5c6ff 10.8s
=> => resolve docker.io/library/ubuntu:16.04@sha256:1f1a2d56de1d604801a9671f301190704c25d604a416f59e03c04f5c6ff 0.0s
=> => sha256:da8ef40b9ecabc2679fe2419957220c0272a965c5cf7e0269falaeeb8c56f2e1 528B / 528B 0.6s
=> => sha256:1f1a2d56de1d604801a9671f301190704c25d604a416f59e03c04f5c6ff 1.42kB / 1.42kB 0.0s
=> => sha256:a3785f78ab8547ae2710c89e627783cfa7ee7824d3468cae6835c9f4eae23ff7 1.15kB / 1.15kB 0.0s
=> => sha256:b6f50765242581c887ff1acc2511fa2d885c52d8fb3ac8c4bba131fd86567f2e 3.36kB / 3.36kB 0.0s
=> => sha256:58690f9b18fca6469a14da4e212c96849469f9b1be6661d2342a4bf01774aa50 46.50MB / 46.50MB 9.0s
=> => sha256:b51569e7c50720acf6860327847fe342a1afbe148d24c529fb81df105e3eed01 857B / 857B 0.5s
=> => sha256:fb15d46c38dcd1ea0b1990006c3366ecd10c79d374f341687eb2cb23a2c8672e 170B / 170B 0.9s
=> => extracting sha256:58690f9b18fca6469a14da4e212c96849469f9b1be6661d2342a4bf01774aa50 1.4s
=> => extracting sha256:b51569e7c50720acf6860327847fe342a1afbe148d24c529fb81df105e3eed01 0.0s
=> => extracting sha256:da8ef40b9ecabc2679fe2419957220c0272a965c5cf7e0269falaeeb8c56f2e1 0.0s
=> => extracting sha256:fb15d46c38dcd1ea0b1990006c3366ecd10c79d374f341687eb2cb23a2c8672e 0.0s
=> [2/3] RUN apt-get update && apt-get install -y nginx 19.4s
=> [3/3] RUN echo 'Hi, I am in your container' >/var/www/html/index.html 0.6s
=> exporting to image 0.5s
=> => exporting layers 0.5s
=> => writing image sha256:6b5b962034a15bb32598c6aee80384ed844d29e960023bfadd1df3983ac7f05c 0.0s
=> => naming to docker.io/andre102/static_web_git:V1.0.0 0.0s
root@JONY-PC:/home/jony102/kiii-homework_2/docker_static_web#
```

Listing 4.30: Bypassing the Dockerfile build cache

```
root@JONY-PC:/home/jony102/kiii-homework_2/docker_static_web# docker build --no-cache -t="andre102/static_web" .
[+] Building 19.9s (7/7) FINISHED
=> [internal] load build definition from Dockerfile 0.0s
=> => transferring dockerfile: 247B 0.0s
```

Listing 4.33: Listing our new Docker image

```
root@JONY-PC:/home/jony102# docker images andre102/static_web
REPOSITORY          TAG         IMAGE ID      CREATED        SIZE
andre102/static_web latest      8a1b4ce75544  5 minutes ago 173MB
root@JONY-PC:/home/jony102#
```

Listing 4.34: Using the docker history command

```
root@JONY-PC:/home/jony102# docker history 8alb4ce75544
IMAGE          CREATED          CREATED BY          SIZE      COMMENT
8alb4ce75544   7 minutes ago   EXPOSE map[80/tcp:{}] 0B        buildkit.dockerfile.v0
<missing>      7 minutes ago   RUN /bin/sh -c echo 'Hello World <3<3<3 ' >/... 20B       buildkit.dockerfile.v0
<missing>      7 minutes ago   RUN /bin/sh -c apt-get update; apt-get insta... 100MB     buildkit.dockerfile.v0
<missing>      7 minutes ago   LABEL maintainer=andrej.bardakoski@students... 0B        buildkit.dockerfile.v0
<missing>      7 days ago      /bin/sh -c #(nop)  CMD ["/bin/bash"]          0B
<missing>      7 days ago      /bin/sh -c #(nop)  ADD file:3478fb5bdcf8ad03d... 72.8MB
<missing>      7 days ago      /bin/sh -c #(nop)  LABEL org.opencontainers... 0B
<missing>      7 days ago      /bin/sh -c #(nop)  LABEL org.opencontainers... 0B
<missing>      7 days ago      /bin/sh -c #(nop)  ARG LAUNCHPAD_BUILD_ARCH    0B
<missing>      7 days ago      /bin/sh -c #(nop)  ARG RELEASE                  0B
root@JONY-PC:/home/jony102#
```

Listing 4.35: Launching a container from our new image

Listing 4.36: Viewing the Docker port mapping

Listing 4.37: The docker port command

Listing 4.38: The docker port command with container name

```
root@JONY-PC:/home/jony102# docker run -d -it -p 80 --name static_web_v1 andre102/static_web_git:V1.0.0 nginx -g "daemon off;"
1a9a8191065f025d6dcbe157b9dd74e1cd939834a2b4628ebdfc1d18ff4d2ca5
root@JONY-PC:/home/jony102# docker ps -l
CONTAINER ID   IMAGE                                COMMAND                  CREATED          STATUS          PORTS                               NAMES
1a9a8191065f   andre102/static_web_git:V1.0.0     "nginx -g 'daemon of..." 16 seconds ago   Up 15 seconds   0.0.0.0:32777->80/tcp, :::32777->80/tcp   static_w
eb_v1
root@JONY-PC:/home/jony102# docker port static_web_v1 80
0.0.0.0:32777
[...]:32777
root@JONY-PC:/home/jony102#
```

Listing 4.39: Exposing a specific port with -p

Listing 4.40: Binding to a different port

Listing 4.41: Binding to a specific interface

Listing 4.42: Binding to a random port on a specific interface

Listing 4.43: Exposing a port with docker run

```
root@JONY-PC:/home/jony102# docker run -d -it -p 12345:80 --name static_web_v2 andre102/static_web_git:V1.0.0 nginx -g "daemon off;"
2c889ff94f8e4bc2bf484e2b9cd1a4e76e7e9a5734f442f05d1bd873333f78ad
root@JONY-PC:/home/jony102# docker run -d -it -p 127.0.0.1:80:80 --name static_web_v2.1 andre102/static_web_git:V1.0.0 nginx -g "daemon off;"
ebcc39ec03804eff713111282465f45f6f826141f0526921876a2f5f79bde6
root@JONY-PC:/home/jony102# docker run -d -it -p 127.0.0.1::80 --name static_web_v3.0 andre102/static_web_git:V1.0.0 nginx -g "daemon off;"
aecdcc4781935db65394355d893ef88ad1655861388d71081bdebac1b788b52a
root@JONY-PC:/home/jony102# docker run -d -it -P --name static_web_v4.0 andre102/static_web_git:V1.0.0 nginx -g "daemon off;"
4c19e8bc478fa8d5817542c6711185c92181503b38e4dec7608e88f191095283
root@JONY-PC:/home/jony102# docker ps
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS                               NAMES
4c19e8bc478f  andre102/static_web_git:V1.0.0     "nginx -g 'daemon of..." 8 seconds ago  Up 7 seconds  0.0.0.0:32779->80/tcp, :::32779->80/tcp  static_w
eb_v4.0
aecdcc478193  andre102/static_web_git:V1.0.0     "nginx -g 'daemon of..." 15 seconds ago Up 14 seconds  127.0.0.1:32769->80/tcp                static_w
eb_v3.0
ebcc39ec0380  andre102/static_web_git:V1.0.0     "nginx -g 'daemon of..." 24 seconds ago Up 23 seconds  127.0.0.1:80->80/tcp                  static_w
eb_v2.1
2c889ff94f8e  andre102/static_web_git:V1.0.0     "nginx -g 'daemon of..." 32 seconds ago Up 31 seconds  0.0.0.0:12345->80/tcp, :::12345->80/tcp  static_w
eb_v2
root@JONY-PC:/home/jony102# |
```

Listing 4.44: Connecting to the container via curl

```
root@JONY-PC:/home/jony102# curl localhost:32779
Hi, I am in your container
root@JONY-PC:/home/jony102# |
```

Listing 4.46: Using the CMD instruction

Listing 4.48: Overriding CMD instructions in the Dockerfile

Listing 4.49: Launching a container with a CMD instruction

```
GNU nano 6.2 Dockerfile
# Version: 0.0.2
FROM ubuntu:20.04
LABEL maintainer="andrej.bardakoski@students.finki.ukim.mk"
RUN apt-get update; apt-get install -y nginx
RUN echo 'Hello World <3<3<3 ' > /var/www/html/index.html
EXPOSE 80
CMD [ "/bin/bash" ]

root@JONY-PC:/home/jony102/kiii-homework_2# mkdir dockerfile_with_CMD
root@JONY-PC:/home/jony102/kiii-homework_2# cd dockerfile_with_CMD/
root@JONY-PC:/home/jony102/kiii-homework_2/dockerfile_with_CMD# nano Dockerfile
root@JONY-PC:/home/jony102/kiii-homework_2/dockerfile_with_CMD# docker build -t="andre102/docker_with_CMD" .
[+] Building 0.0s (0/0)
ERROR: invalid tag "andre102/docker_with_CMD": repository name must be lowercase
root@JONY-PC:/home/jony102/kiii-homework_2/dockerfile_with_CMD# docker build -t="andre102/docker_with_cmd" .
[+] Building 0.4s (7/7) FINISHED
=> [internal] load .dockerignore 0.0s
=> => transferring context: 2B 0.0s
=> [internal] load build definition from Dockerfile 0.0s
=> => transferring dockerfile: 267B 0.0s
=> [internal] load metadata for docker.io/library/ubuntu:20.04 0.0s
=> [1/3] FROM docker.io/library/ubuntu:20.04 0.0s
=> CACHED [2/3] RUN apt-get update; apt-get install -y nginx 0.0s
=> [3/3] RUN echo 'Hello World <3<3<3 ' > /var/www/html/index.html 0.3s
=> exporting to image 0.0s
=> => exporting layers 0.0s
=> => writing image sha256:5c84849b32ba69ef15a908efea5371c36bae46c04ac0d571dabb1fade82e5340 0.0s
=> => naming to docker.io/andre102/docker_with_cmd 0.0s
root@JONY-PC:/home/jony102/kiii-homework_2/dockerfile_with_CMD# docker run -it andre102/docker_with_cmd
root@4451ccdb91c9:/# |
```

Listing 4.50: Overriding a command locally

```
root@JONY-PC:/home/jony102# docker run -it andre102/docker_with_cmd /bin/ps
  PID TTY          TIME CMD
    1 pts/0        00:00:00 ps
root@JONY-PC:/home/jony102# |
```

Listing 4.51: Specifying an ENTRYPOINT

Listing 4.53: Rebuilding static_web with a new ENTRYPOINT

Listing 4.54: Using docker run with ENTRYPOINT

```
GNU nano 6.2 Dockerfile *
# Version: 0.0.2
FROM ubuntu:20.04
LABEL maintainer="andrej.bardakoski@students.finki.ukim.mk"
RUN apt-get update; apt-get install -y nginx
RUN echo 'Hello World <3<3<3 ' > /var/www/html/index.html
EXPOSE 80
ENTRYPOINT ["/usr/sbin/nginx"]|
```

```
root@JONY-PC:/home/jony102# docker run -it andre102/docker_with_entrypnt -g "daemon off;"
```

```
root@JONY-PC:/home/jony102# docker run -it andre102/docker_with_entrypnt -h
nginx version: nginx/1.18.0 (Ubuntu)
Usage: nginx [-?hvVtTq] [-s signal] [-c filename] [-p prefix] [-g directives]

Options:
  -?, -h      : this help
  -v          : show version and exit
  -V          : show version and configure options then exit
  -t          : test configuration and exit
  -T          : test configuration, dump it and exit
  -q          : suppress non-error messages during configuration testing
  -s signal   : send signal to a master process: stop, quit, reopen, reload
  -p prefix   : set prefix path (default: /usr/share/nginx/)
  -c filename : set configuration file (default: /etc/nginx/nginx.conf)
  -g directives : set global directives out of configuration file
```

Listing 4.57: Overriding the working directory

```
root@JONY-PC:/home/jony102# docker run -it -w /var/log ubuntu pwd
/var/log
```

Listing 4.64: Runtime environment variables

```
root@JONY-PC:/home/jony102# docker run -it -e "WEB_PORT=8080" ubuntu env
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin
HOSTNAME=59d1bcacf17ed
TERM=xterm
WEB_PORT=8080
HOME=/root
root@JONY-PC:/home/jony102# |
```

Listing 4.69: Using the ADD instruction

```

GNU nano 6.2 Dockerfile *
# Version: 0.1.0
FROM ubuntu:20.04
LABEL maintainer="andrej.bardakoski@students.finki.ukim.mk"
RUN apt-get update; apt-get install -y nginx
RUN echo 'Hello World <3<3<3 ' > /var/www/html/index.html
ADD data.txt /new_Data/
EXPOSE 80
CMD [ "/bin/bash" ]

GNU nano 6.2 data.txt *
this is some data file
that will be copied from the build directory
to the docker image

root@JONY-PC:/home/jony102/kiii-homework_2# mkdir dockerfile_with_ADD
root@JONY-PC:/home/jony102/kiii-homework_2# cd dockerfile_with_ADD/
root@JONY-PC:/home/jony102/kiii-homework_2/dockerfile_with_ADD# nano Dockerfile
root@JONY-PC:/home/jony102/kiii-homework_2/dockerfile_with_ADD# nano data.txt
root@JONY-PC:/home/jony102/kiii-homework_2/dockerfile_with_ADD# docker build -t="andre102/docker_with_add" .
[+] Building 0.2s (9/9) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 291B
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [internal] load metadata for docker.io/library/ubuntu:20.04
=> [1/4] FROM docker.io/library/ubuntu:20.04
=> [internal] load build context
=> => transferring context: 124B
=> CACHED [2/4] RUN apt-get update; apt-get install -y nginx
=> CACHED [3/4] RUN echo 'Hello World <3<3<3 ' > /var/www/html/index.html
=> [4/4] ADD data.txt /new_Data/
=> exporting to image
=> => exporting layers
=> => writing image sha256:9fbda86c4bb5390c824c2b9917184903b7b66c6c5f35dd668ef6c4f6451c9df8
=> => naming to docker.io/andre102/docker_with_add
root@JONY-PC:/home/jony102/kiii-homework_2/dockerfile_with_ADD# docker run -it andre102/docker_with_add

root@72064b50bb72:/# cd new_Data
root@72064b50bb72:/new_Data# ls
data.txt
root@72064b50bb72:/new_Data# cat data.txt
this is some data file
that will be copied from the build directory
to the docker image
root@72064b50bb72:/new_Data#

```

Listing 4.84: A new ONBUILD image Dockerfile

Listing 4.85: Building the apache2 image

```
GNU nano 6.2 Dockerfile *
FROM ubuntu:20.04
LABEL maintainer="andrej.bardakoski@students.finki.ukim.mk"
RUN apt-get update; apt-get install -y apache2
ENV APACHE_RUN_USER www-data
ENV APACHE_RUN_GROUP www-data
ENV APACHE_LOG_DIR /var/log/apache2
ENV APACHE_PID_FILE /var/run/apache2.pid
ENV APACHE_RUN_DIR /var/run/apache2
ENV APACHE_LOCK_DIR /var/lock/apache2
ONBUILD ADD . /var/www/
EXPOSE 80
ENTRYPOINT ["/usr/sbin/apachectl"]
CMD ["-D", "FOREGROUND"]
```

Listing 4.86: The webapp Dockerfile


Listing 4.87: Building our webapp image

```
GNU nano 6.2 Dockerfile *
FROM jamtur01/apache2
LABEL maintainer="andrej.bardakoski@students.finki.ukim.mk"
ENV APPLICATION_NAME webapp
ENV ENVIRONMENT development

root@JONY-PC:/home/jony102/kiii-homework_2# mkdir webapp
root@JONY-PC:/home/jony102/kiii-homework_2# cd webapp/
root@JONY-PC:/home/jony102/kiii-homework_2/webapp# nano Dockerfile
root@JONY-PC:/home/jony102/kiii-homework_2/webapp# docker build -t"adnre102/webapp" .
[+] Building 23.3s (6/6) FINISHED
=> [internal] load build definition from Dockerfile 0.0s
=> => transferring dockerfile: 177B 0.0s
=> [internal] load .dockerignore 0.0s
=> => transferring context: 2B 0.0s
=> [internal] load metadata for docker.io/jamtur01/apache2:latest 1.7s
=> [auth] jamtur01/apache2:pull token for registry-1.docker.io 0.0s
=> [1/1] FROM docker.io/jamtur01/apache2@sha256:d2b9b16c458a677dd2bfdd45255c9ce76029718a9e583676a0b58716304b694 21.6s
=> => resolve docker.io/jamtur01/apache2@sha256:d2b9b16c458a677dd2bfdd45255c9ce76029718a9e583676a0b58716304b6949 0.0s
=> => sha256:7b29cd6ef7877d3f0ee1cbd2b7f74740e490808bd9df68fc5663116839bd3ae7 66.42MB / 66.42MB 0.0s
=> => sha256:b2902dd469dbd8da6007740e75ce10534f75fc1245b207a5b3ef6592f970fe5c 20.79MB / 20.79MB 0.0s
=> => sha256:023eeb8b62e84da9c161c81e9fa83a1ae0c4a50a461182507e2f95cca41532a9 290B / 290B 0.0s
=> => extracting sha256:7b29cd6ef7877d3f0ee1cbd2b7f74740e490808bd9df68fc5663116839bd3ae7 2.9s
=> => extracting sha256:b2902dd469dbd8da6007740e75ce10534f75fc1245b207a5b3ef6592f970fe5c 0.9s
=> => extracting sha256:023eeb8b62e84da9c161c81e9fa83a1ae0c4a50a461182507e2f95cca41532a9 0.0s
=> => exporting to image 0.0s
=> => exporting layers 0.0s
=> => writing image sha256:0d1d84b14266e59239b75140d973f23117b709680db0cab173569f8956f5b6ff 0.0s
=> => naming to docker.io/adnre102/webapp 0.0s
root@JONY-PC:/home/jony102/kiii-homework_2/webapp# |
```

Listing 4.89: Pushing a Docker image

```
root@JONY-PC:/home/jony102# docker push andre102/static_web
Using default tag: latest
The push refers to repository [docker.io/andre102/static_web]
e78e66516fb5: Pushed
32ae11d89b93: Pushed
6021993d84a2: Mounted from library/ubuntu
latest: digest: sha256:0967b58cc6711fc36939a3704e73273f5b7188c4eb71a693ee45542d4e37a284 size: 948
root@JONY-PC:/home/jony102#
```



andre102/static_web ☆
By [andre102](#) • Updated 2 minutes ago


Manage Repository

📄 Pulls 0

Image

Overview

Tags



No overview available

This repository doesn't have an overview

Docker Pull Command

```
docker pull andre102/static_...
```

Listing 4.90: Deleting a Docker image

```
root@JONY-PC: /home/jony102# docker rmi andre102/static_web
Untagged: andre102/static_web:latest
Untagged: andre102/static_web@sha256:0967b58cc6711fc36939a3704e73273f5b7188c4eb71a693ee45542d4e37a284
Deleted: sha256:8a1b4ce75544b424becb09e80a9aaeed7d1864787e8e371c865ba0baac925269
root@JONY-PC: /home/jony102#
```

Deleting a Docker repository

Delete Repository: andre102/static_web

This deletes the repository, all the images it contains, and its build settings. This cannot be undone.

Please type the name of your repository to confirm deletion: static_web

static_web

Cancel

Delete

andre102 / static_web

Contains: No content | Last pushed: 8 minutes ago

Deleting

This repository is being deleted.

Listing 4.92: Deleting all images

```
root@JONY-PC: /home/jony102# docker rmi `docker images -a -q`
Untagged: andre102/apache2:latest
Deleted: sha256:775a9dda74a61b58ccf4a97073e55c0111a4219da25b0ecf621199c7dffa6d61
Untagged: andre102/docker_with_cmd:latest
Deleted: sha256:5c84849b32ba69ef15a908efea5371c36bae46c04ac0d571dabb1fade82e5340
Untagged: andre102/static_web_git:V1.0.0
Deleted: sha256:6b5b962034a15bb32598c6aee80384ed844d29e960023bfadd1df3983ac7f05c
Untagged: andre102/nat_apache2:NewTag
Deleted: sha256:a0936b0135d96ba07bbc1f78d56cd1764846e3fb74f2018c32d7572d01a0c94c
Untagged: andre102/nat_apache2:latest
Deleted: sha256:732a33e9c77e07e93cc84b2a5a52dbaede77ecd8a79b850a5603ca8bc500d7e2
Deleted: sha256:1256cd13b7483635ffcc55dd92838a956db094dc08e7c930efb4ba4dc9814256
Untagged: nginx:latest
Untagged: nginx@sha256:aa0afebbb3cfa473099a62c4b32e9b3fb73ed23f2a75a65ce1d4b4f55a5c2ef2
Deleted: sha256:904b8cb13b932e23230836850610fa45dce9eb0650d5618c2b1487c2a4f577b8
Deleted: sha256:2c19cc81bd7d9245f864a8dad55fc439a503efbc9a6f971307099c426371e5df
Deleted: sha256:a244752d2cc30ced3987603eb318fdf7ddd1f16a9c04de65fe44bd849ac79b1a
Deleted: sha256:09d2e7b44137eaa7f2c092a9e956f63074c8d4fd72870e35a064d8dabc3c3351
Deleted: sha256:a6ecfbc1b8be1e553e7b9a5ca036e449a51c46cb22ae3193e67a72d4273aa8ca
Deleted: sha256:26b53bdf904af4f66504b2cdbc6dbf2f8aa4fdc74204b4de2389ae96c1b3ea05
Deleted: sha256:650abce4b096b06ac8bec2046d821d66d801af34f1f1d4c5e272ad030c7873db
Untagged: fedora:20
Untagged: fedora@sha256:5d5a02b873d298da9bca4b84440c5cd698b0832560c850d92cf389cef58bc549
Deleted: sha256:ba74bddb630e4dc18b3c97241f7e7fc5fb4babfd0d79e10b73f5d85b52db46ae
Deleted: sha256:aca8e3909c1e86667827a2bb101be6fdb3c14ee450ab3bdcfc5efdbd9c277890
Untagged: fedora:21
Untagged: fedora@sha256:a268e5e12257c7770eb44c24041baf5e728fba2eed1a84f007b81845ded0a485
Deleted: sha256:ba6369d667d15c1f4f7d7aaa1bde5389e68eaa5d57a86a4459a52b5b7457d9f
Deleted: sha256:e22123a887b7bde9324982b931f2c2d16a613bf55592ba82946c1439c542242d
Untagged: jamtur01/puppetmaster:latest
Untagged: jamtur01/puppetmaster@sha256:2eedcf4cbe50f7052b420b2b125969873872d76ce36752f04f5160160acd1258
Deleted: sha256:ada3e5bfc4686d4140b7498ec17710564875ca0291c2c210e1ae057c6609bffa
```