

Task 3: Building images

Creating a Dockerfile

- To create a new Dockerfile, run the command `touch Dockerfile` in your working directory. Then open the file using your preferred text editor.
- Inside the Dockerfile, add the following lines at the top:

```
Task-3 > Dockerfile > ...
1 FROM ubuntu
2 LABEL maintainer="Ankit <ankit@example.com>"
3
```

- These lines specify the base image to use for the new image (in this case, Ubuntu) and add a label to the image that includes the maintainer's name and email address.
- To install ping inside the image, add the following line after the LABEL directive:
- This command will first update the package list and then install the `iputils-ping` package.
- Your Dockerfile should now look something like this:

```
Task-3 > Dockerfile > ...
1 FROM ubuntu
2 LABEL maintainer="Ankit <ankit@example.com>"
3
4 RUN apt-get update && apt-get install -y iputils-ping
5
```

- To build the Docker image, run the following command in the directory containing the Dockerfile:

```
● ankit@sf-cpu-082:~/Documents/Assignment/Docker/docker-training$ cd Task-3
● ankit@sf-cpu-082:~/Documents/Assignment/Docker/docker-training/Task-3$ ls
Dockerfile
● ankit@sf-cpu-082:~/Documents/Assignment/Docker/docker-training/Task-3$ docker build -t ubuntu-ping .
[+] Building 13.6s (6/6) FINISHED
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 148B
=> [internal] load metadata for docker.io/library/ubuntu:latest
=> [1/2] FROM docker.io/library/ubuntu
=> [2/2] RUN apt-get update && apt-get install -y iputils-ping
=> exporting to image
=> => exporting layers
=> => writing image sha256:3807281bcbdf1999db5d3e3b85886ae4064d8d3b6d6c0dd8c3bdf2f42aff4fe0
=> => naming to docker.io/library/ubuntu-ping
● ankit@sf-cpu-082:~/Documents/Assignment/Docker/docker-training/Task-3$ docker images
REPOSITORY          TAG             IMAGE ID        CREATED         SIZE
ubuntu-ping         latest         3807281bcbdf   5 seconds ago  123MB
ping-ubuntu         latest         5824a33829a3   11 minutes ago 123MB
busybox             latest         7cfbbec8963d   5 weeks ago    4.86MB
ubuntu              latest         08d22c0ceb15   6 weeks ago    77.8MB
node                12            6c8de432fc7f   12 months ago  918MB
hello-world         latest         feb5d9fea6a5   19 months ago  13.3kB
● ankit@sf-cpu-082:~/Documents/Assignment/Docker/docker-training/Task-3$
```

- When building Docker images, each directive in the Dockerfile maps to a step, and after each step is completed, it becomes a commit. Docker layers each commit on top of the other, which makes images small and improves rebuilding times. However, it also includes temporary data written to the filesystem, generating extra size to the image. To minimize image size, RUN commands can be modified to remove any old logs after the installation completes, and to collapse all the related RUN directives together. This results in a smaller image size and a quicker push/pull process.
- The Dockerfile provides various useful directives including COPY, WORKDIR, CMD, ENV, EXPOSE, and ARG. For building a Dockerfile for ping, ENV and CMD directives can be added.

The screenshot shows a VS Code editor with a Dockerfile named 'Dockerfile-1' open. The Dockerfile contains the following instructions:

```

1 FROM ubuntu:16.04
2 LABEL author="Ankit Pipalia"
3
4 ENV PING_TARGET "google.com"
5
6 RUN apt-get update \
7     && apt-get install -y iputils-ping \
8     && apt-get clean \
9     && cd /var/lib/apt/lists && rm -fr *Release* *Sources* *Packages* \
10    && truncate -s 0 /var/log/*log
11
12 CMD ["sh", "-c", "ping $PING_TARGET"]

```

The terminal output shows the successful build of the 'ping-ubuntu-lite' image. The build process includes steps for transferring context, loading build definitions, resolving dependencies, extracting layers, and finally exporting the image. The resulting image has a size of 13.3KB.

```

ankit@sf-cpu-082:~/Documents/Assignment/Docker/docker-training/Task-3$ docker build -t ping-ubuntu-lite .
[*] Building 23.8s (6/6) FINISHED
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 347B
=> [internal] load metadata for docker.io/library/ubuntu:16.04
=> [1/2] FROM docker.io/library/ubuntu:16.04@sha256:1f1a2d56de1d604801a9671f301190704c25d604a416f59e03c04f5c6ffee0d6
=> => resolve docker.io/library/ubuntu:16.04@sha256:1f1a2d56de1d604801a9671f301190704c25d604a416f59e03c04f5c6ffee0d6
=> => sha256:1f1a2d56de1d604801a9671f301190704c25d604a416f59e03c04f5c6ffee0d6 1.42kB / 1.42kB
=> => sha256:a3705f70ab857ae2710c89e27783cfa1ee024d3468caed035c9f4ee23f7f 1.15kB / 1.15kB
=> => sha256:b6f50765242581c8877ff1acc2511fa2d885c52d8fb3ac8c4bba131fd8656772e 3.36kB / 3.36kB
=> => sha256:58690f9b18fca6469a14da4e212c96849469f9b1be6661d2342a4bf01774aa50 46.50MB / 46.50MB
=> => sha256:b51569e7c50720acfb080327847fe342a1afbe148d24c529fb81df105e3eed01 857B / 857B
=> => sha256:d8be4009ecabc2679fc2419957220c0272a963c5f7e0269f1aeeb0c50f2e1 520B / 520B
=> => sha256:fb15d46c38dcd1ea0b1990006c3366ecd10c79d374f341687eb2cb23a2c8672e 170B / 170B
=> => extracting sha256:58690f9b18fca6469a14da4e212c96849469f9b1be6661d2342a4bf01774aa50
=> => extracting sha256:b51569e7c50720acfb080327847fe342a1afbe148d24c529fb81df105e3eed01
=> => extracting sha256:d8be4009ecabc2679fc2419957220c0272a963c5f7e0269f1aeeb0c50f2e1
=> => extracting sha256:fb15d46c38dcd1ea0b1990006c3366ecd10c79d374f341687eb2cb23a2c8672e
=> [2/2] RUN apt-get update && apt-get install -y iputils-ping && apt-get clean && cd /var/lib/apt/lists && rm -fr *Release* *Sources* *Packages* && truncate -s 0 /var/log/*log
=> => exporting to image
=> => writing image sha256:67cb935c126f1f296b472d1ae0a3439d9839bc900a3f6b88316e320841363ee7
=> => naming to docker.io/library/ping-ubuntu-lite
ankit@sf-cpu-082:~/Documents/Assignment/Docker/docker-training/Task-3$ docker images
REPOSITORY          TAG             IMAGE ID        CREATED         SIZE
ping-ubuntu-lite    latest          67cb935c126f   35 seconds ago 13.3MB
ubuntu-ping         latest          5824a33829a3   18 minutes ago 123MB
busybox             latest          7c7f0ec809c3d   5 weeks ago    4.86MB
ubuntu              latest          86d22c0eb15     6 weeks ago    77.8MB
node                12             6c8de432fc7f   12 months ago  918MB
hello-world         latest          feb5d9fea6a5   19 months ago  13.3KB

```