Assignment 2b: Create a Docker Container

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(1) What is Docker?

Docker is an open platform for developing, shipping, and running applications. Docker enables you to separate your applications from your infrastructure so you can deliver software quickly. With Docker, you can manage your infrastructure in the same ways you manage your applications. By taking advantage of Docker's methodologies for shipping, testing, and deploying code quickly, you can significantly reduce the delay between writing code and running it in production.

* Pre-requisite before installing docker:

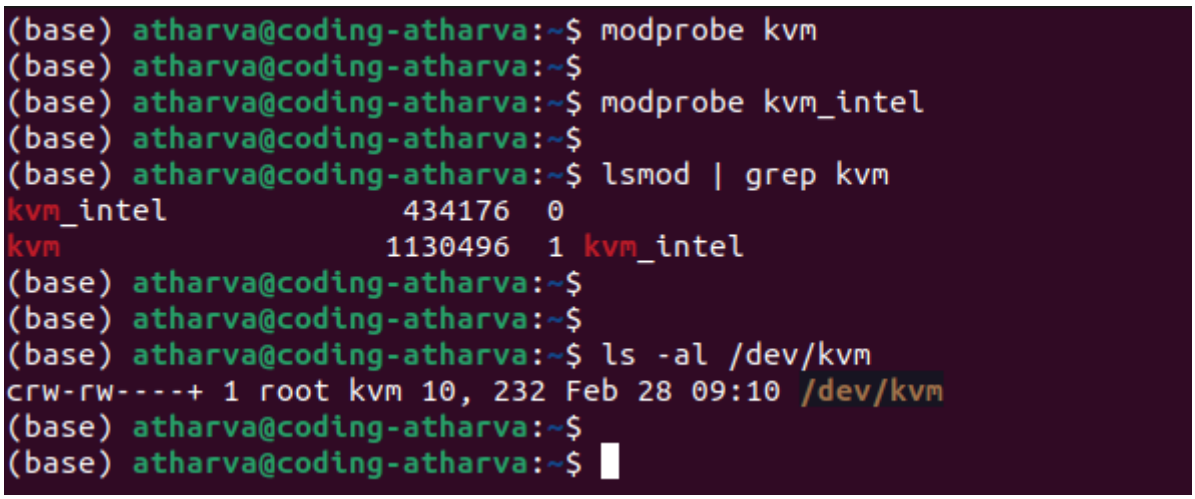
1) Check KVM virtualization support:

What is KVM?

KVM (for Kernel-based Virtual Machine) is a full virtualization solution for Linux on x86 hardware containing virtualization extensions (Intel VT or AMD-V). It consists of a loadable kernel module, kvm.ko, that provides the core virtualization infrastructure and a processor specific module, kvm-intel.ko or kvm-amd.ko.

Using KVM, one can run multiple virtual machines running unmodified Linux or Windows images. Each virtual machine has private virtualized hardware: a network card, disk, graphics adapter, etc.

KVM is open source software. The kernel component of KVM is included in mainline Linux, as of 2.6.20. The userspace component of KVM is included in mainline QEMU, as of 1.3.

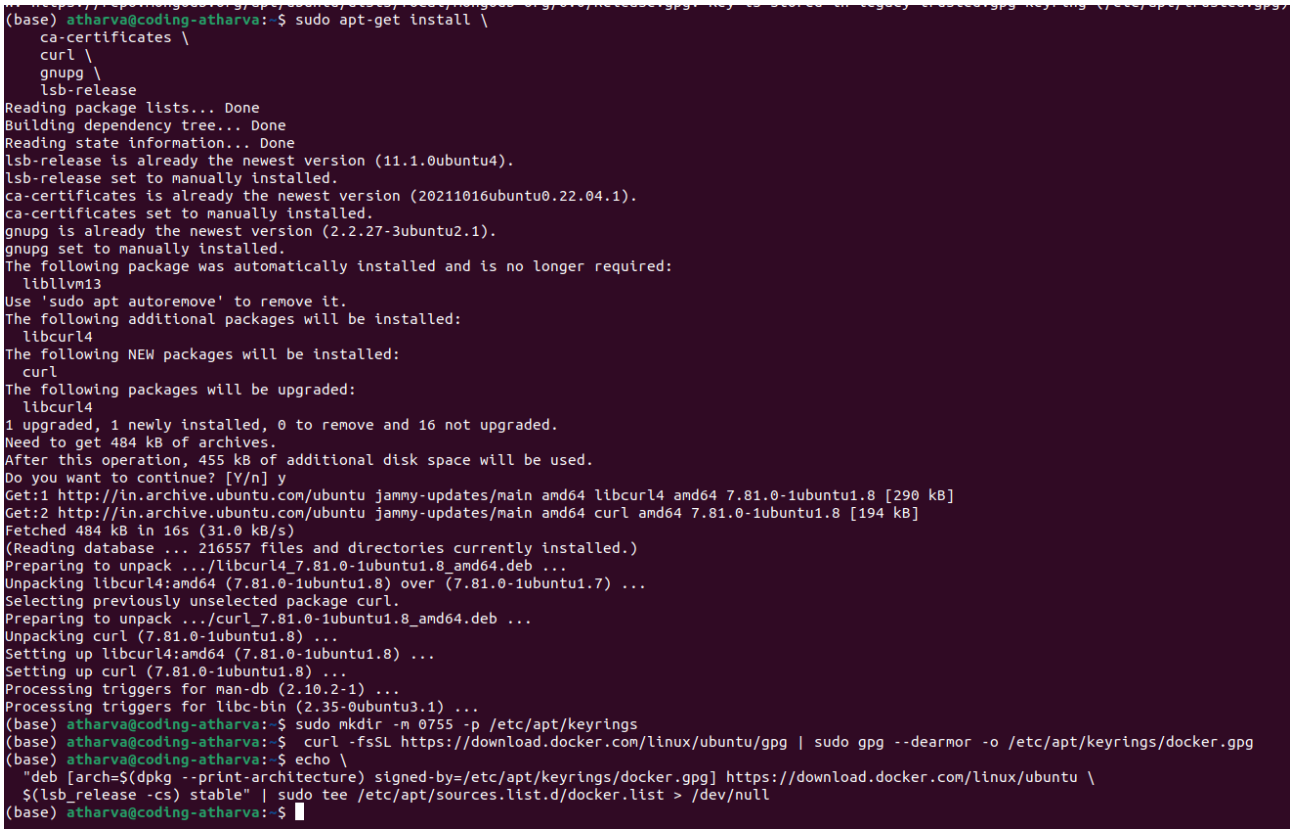


2) QEMU must be version 5.2 or newer. We recommend upgrading to the latest version.

What is QEUM?

QEMU is a free and open-source emulator. It emulates the machine's processor through dynamic binary translation and provides a set of different hardware and device models for the machine, enabling it to run a variety of guest operating systems.

3) Setup the Repository:



4) Install Docker Engine, containerd, and Docker Compose.

sudo apt-get update

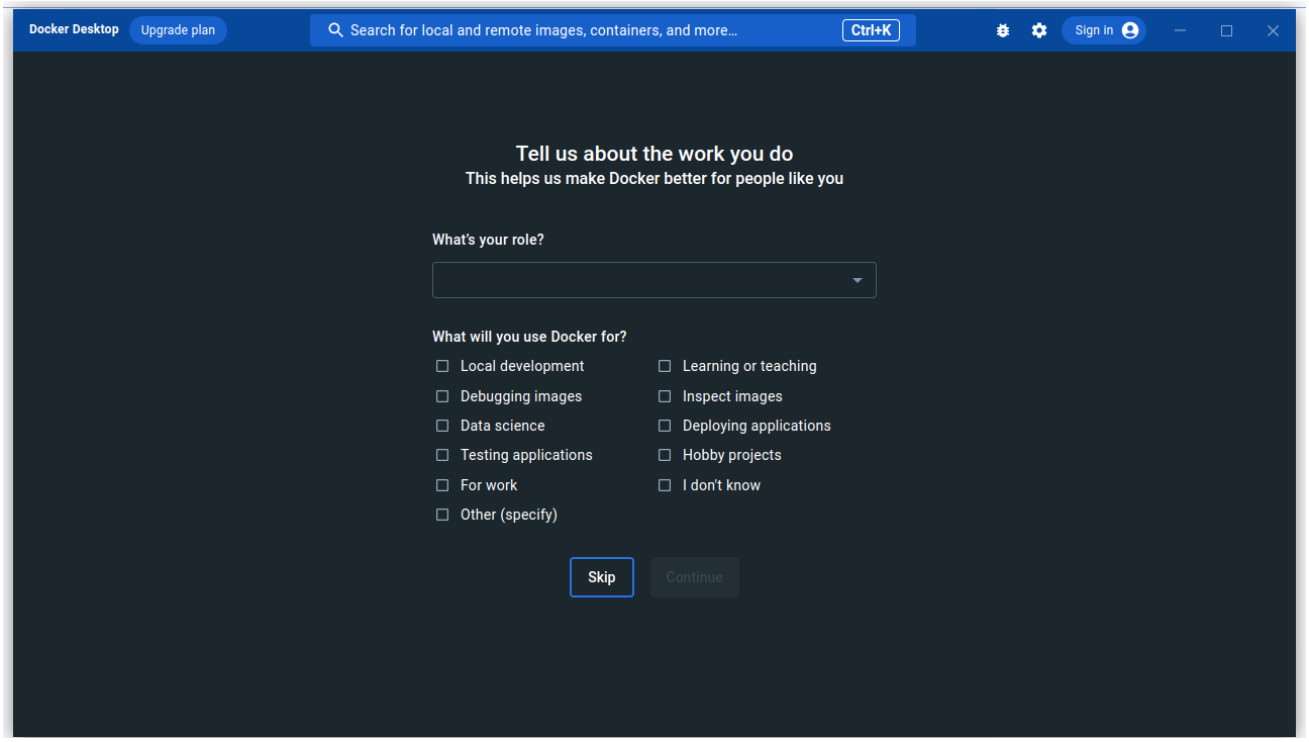
sudo apt-get install docker-ce docker-ce-cli containerd.io docker-buildx-plugin docker-compose-plugin

5) Verify that the Docker Engine installation is successful by running the hello-world image:

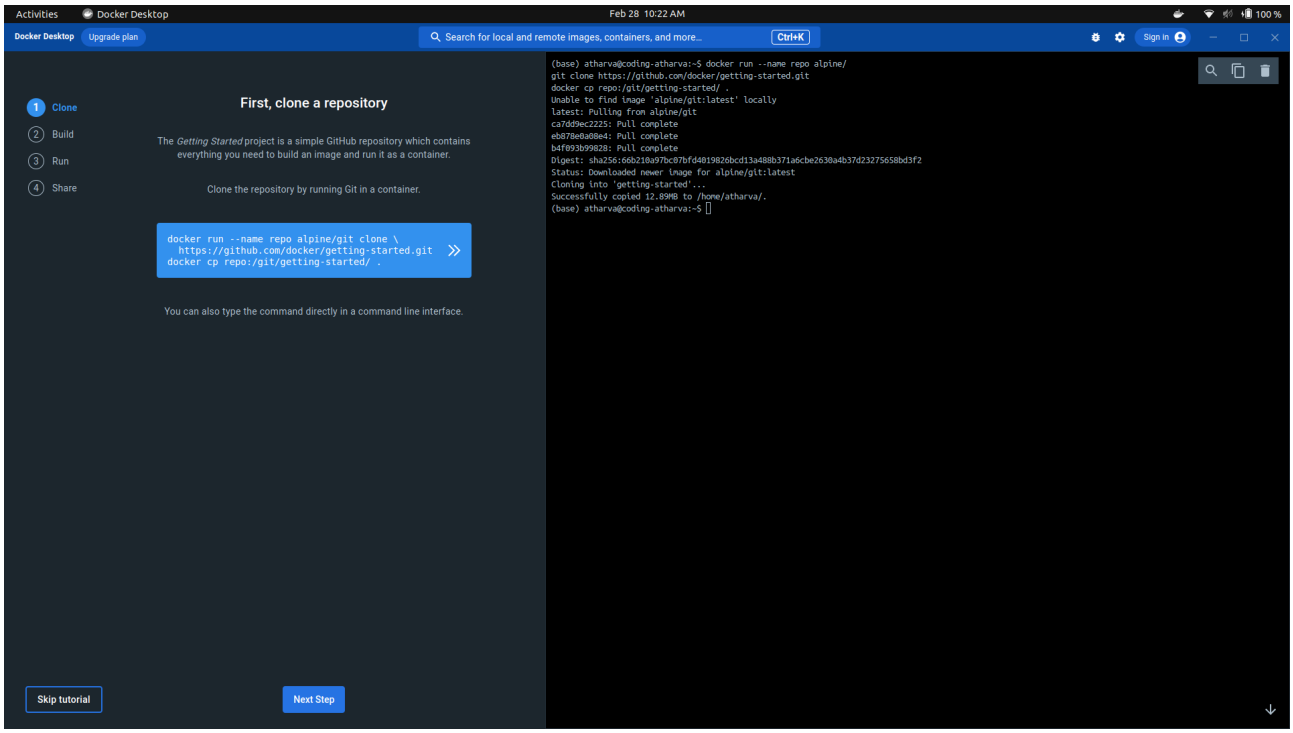
```
(base) atharva@coding-atharva:~/Downloads$ sudo docker run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
2db29710123e: Pull complete
Digest: sha256:6e8b6f026e0b9c419ea0fd02d3905dd0952ad1feea67543f525c73a0a790fefb
Status: Downloaded newer image 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/

(base) atharva@coding-atharva:~/Downloads$
```

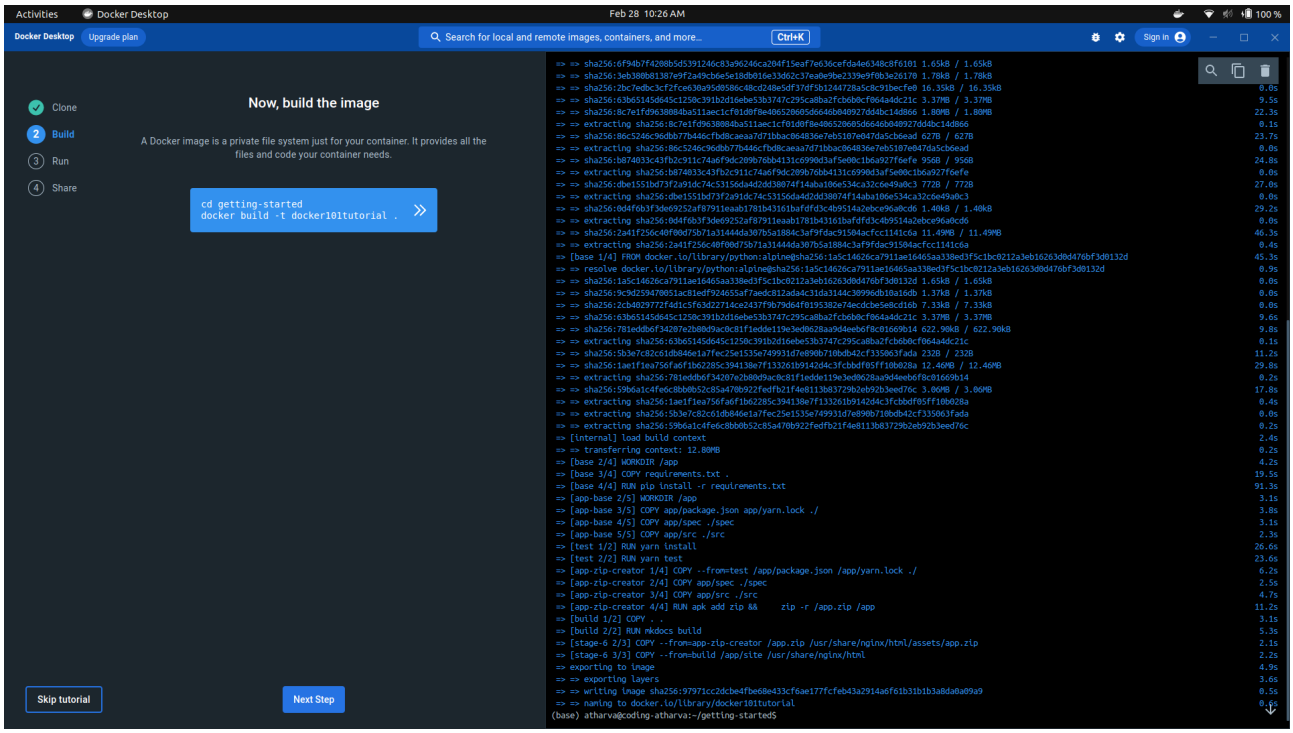
6) Install: sudo apt-get install ./docker-desktop-4.17.0-amd64.deb

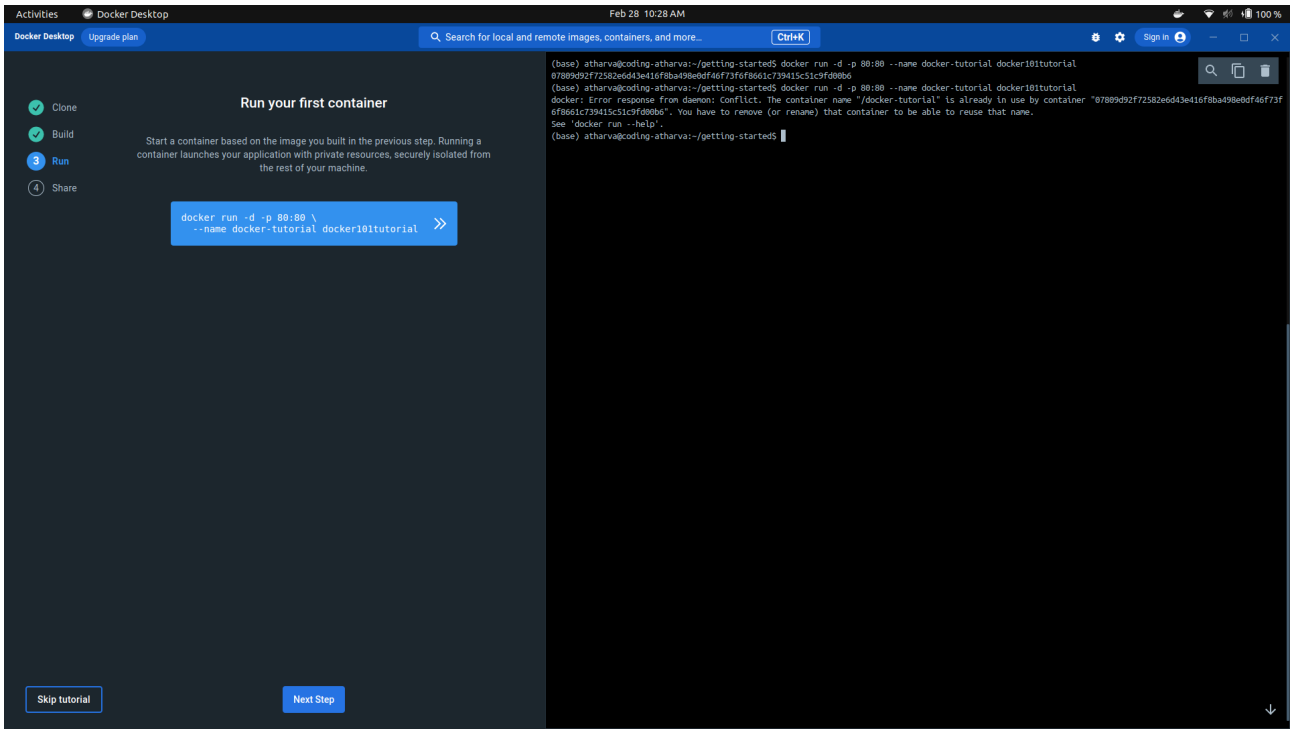
7) Run: systemctl --user start docker-desktop

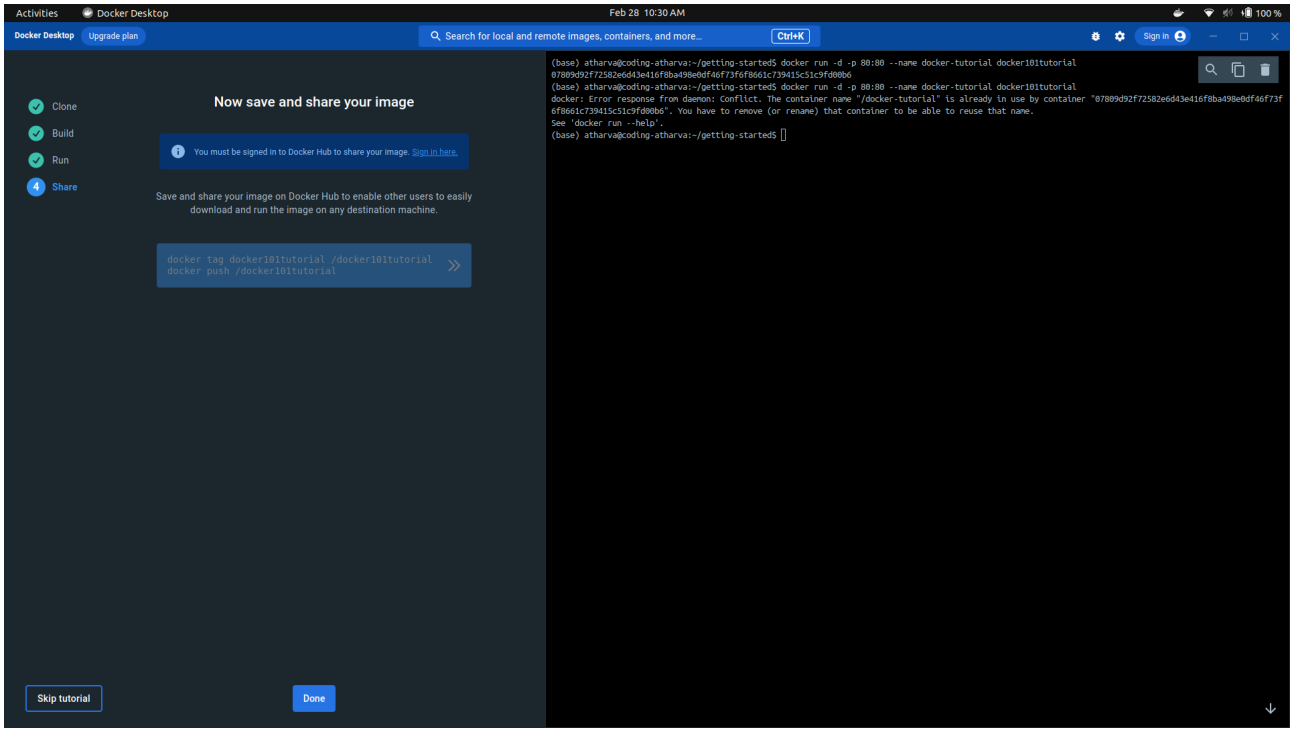


Creating First Container:

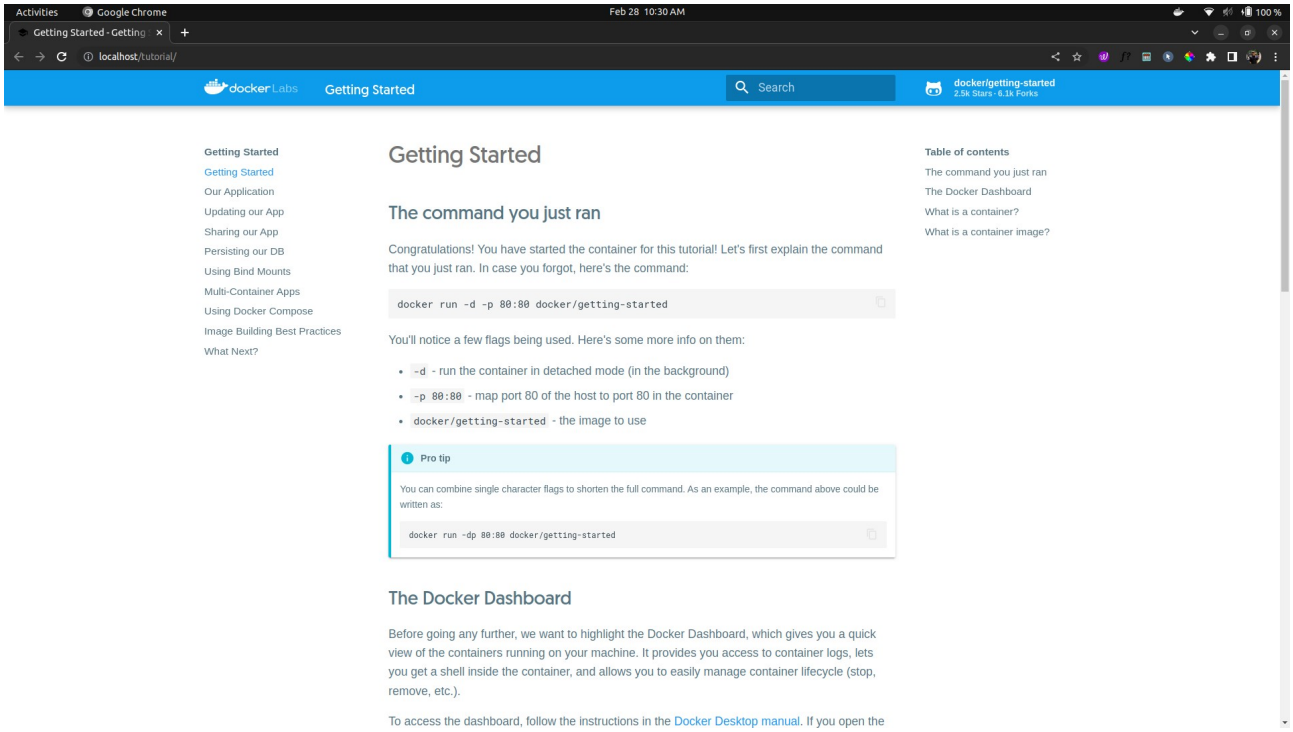





Activities
Docker Desktop
Feb 28 10:28 AM
100 %
Docker Desktop
Upgrade plan
Search for local and remote images, containers, and more...
Ctrl+K
Sign in
Clone
Build
3 Run
4 Share
Run your first container
Start a container based on the image you built in the previous step. Running a container launches your application with private resources, securely isolated from the rest of your machine.
docker run -d -p 80:80 \
--name docker-tutorial docker101tutorial
(base) atharva@coding-atharva:~/getting-started$ docker run -d -p 80:80 --name docker-tutorial docker101tutorial
07809d92f72582e6d43e416f8ba498e0df46f73f6f8661c739415c51c9fd00b6
(base) atharva@coding-atharva:~/getting-started$ docker run -d -p 80:80 --name docker-tutorial docker101tutorial
docker: Error response from daemon: Conflict. The container name "/docker-tutorial" is already in use by container "07809d92f72582e6d43e416f8ba498e0df46f73f6f8661c739415c51c9fd00b6". You have to remove (or rename) that container to be able to reuse that name.
See 'docker run --help'.
(base) atharva@coding-atharva:~/getting-started$
Skip tutorial
Next Step


Activities
Docker Desktop
Feb 28 10:30 AM
100 %
Docker Desktop
Upgrade plan
Search for local and remote images, containers, and more...
Ctrl+K
Sign in
Clone
Build
Run
4 Share
Now save and share your image
You must be signed in to Docker Hub to share your image. Sign in here.
Save and share your image on Docker Hub to enable other users to easily download and run the image on any destination machine.
docker tag docker101tutorial /docker101tutorial
docker push /docker101tutorial
(base) atharva@coding-atharva:~/getting-started$ docker run -d -p 80:80 --name docker-tutorial docker101tutorial
07809d92f72582e6d43e416f8ba498e0df46f73f6f8661c739415c51c9fd00b6
(base) atharva@coding-atharva:~/getting-started$ docker run -d -p 80:80 --name docker-tutorial docker101tutorial
docker: Error response from daemon: Conflict. The container name "/docker-tutorial" is already in use by container "07809d92f72582e6d43e416f8ba498e0df46f73f6f8661c739415c51c9fd00b6". You have to remove (or rename) that container to be able to reuse that name.
See 'docker run --help'.
(base) atharva@coding-atharva:~/getting-started$
Skip tutorial
Done

Successfuly Started the Container:



Running Container: