

SWE-4008 Application Development & Deployment
Architecture LAB



LAB ASSIGNMENT- 2

DOCKER LAB MANUAL

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Step-1: Docker Installation Procedure:

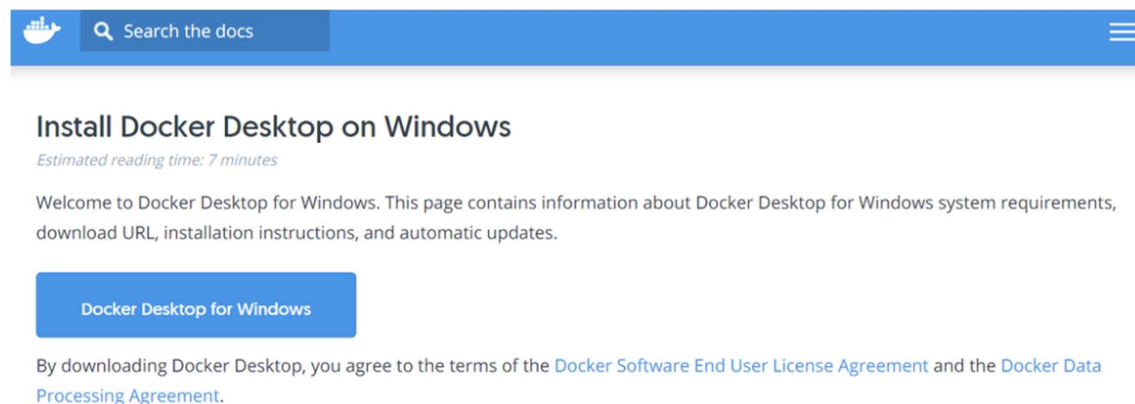
i. Step 1: Download Docker Desktop

Open your preferred web browser (e.g., Chrome).

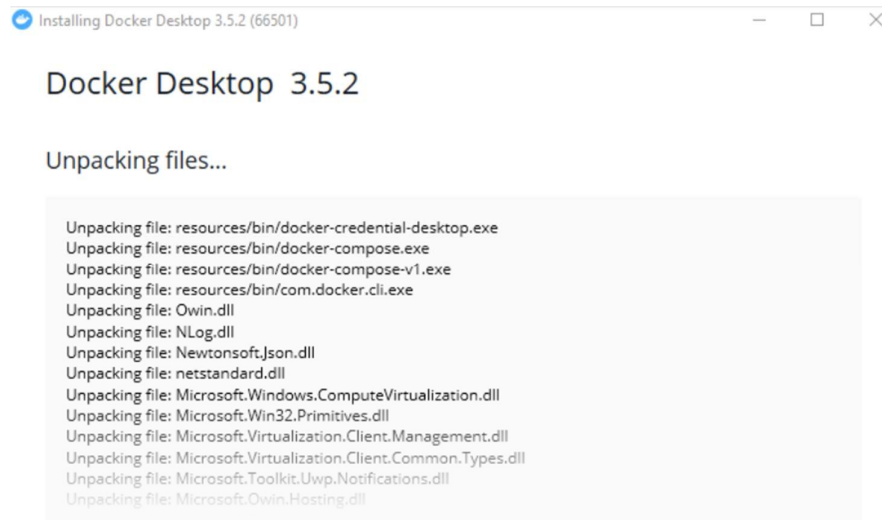
Then search in the browser by typing s “Docker download” and press Enter.

Click on the first link that appears in the search results.

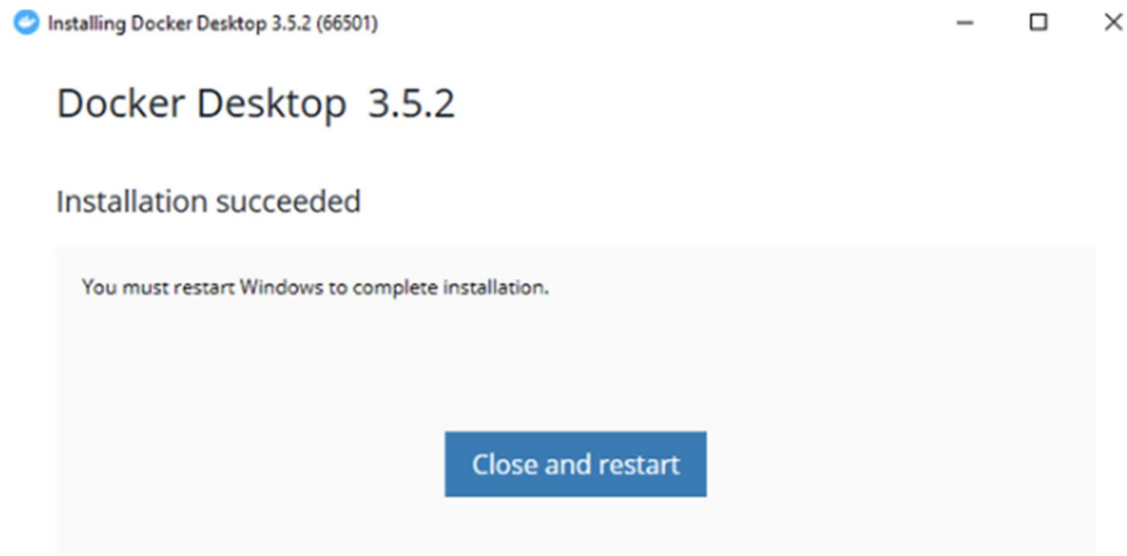
(<https://docs.docker.com/desktop/setup/install/windows-install/>)



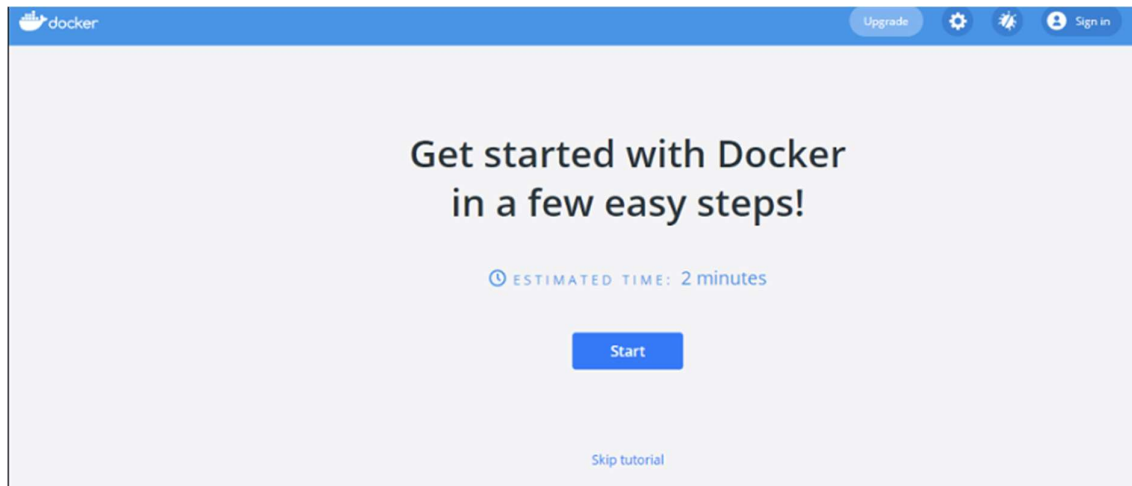
ii. The installer will ask you to install WSL2, so click on the tick box next to it and click on ok. This will download and install WSL2 for you as shown below:



iii. Then we will need to restart our system, so click on “Close and restart” button in the Docker installer window.



iv. After you restart the computer it will open up the Docker windows as shown below:



v. At this point we have successfully installed docker on our Windows operating system. We can verify this using the below command:

docker version

```
PS C:\WINDOWS\system32\cmd.exe X Windows PowerShell X Windows PowerShell X + -
Windows PowerShell
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PS C:\Users\Lokesh> docker version
Client:
 Version:           27.4.0
 API version:       1.47
 Go version:        go1.22.10
 Git commit:        bde2b89
 Built:             Sat Dec  7 10:40:21 2024
 OS/Arch:           windows/amd64
 Context:           desktop-linux

Server: Docker Desktop 4.37.1 (178610)
 Engine:
  Version:          27.4.0
  API version:      1.47 (minimum version 1.24)
  Go version:       go1.22.10
  Git commit:       92a8393
  Built:            Sat Dec  7 10:38:57 2024
  OS/Arch:          linux/amd64
  Experimental:     false
 containerd:
  Version:          1.7.21
  GitCommit:        472731909fa34bd7bc9c887e4c27943f9835f111
 runc:
  Version:          1.1.13
  GitCommit:        v1.1.13-0-g58aa920
 docker-init:
  Version:          0.19.0
  GitCommit:        de40ad0
PS C:\Users\Lokesh>
```

Step 2: Important Docker Commands:-

- i. **Docker Run command** : This command is used to run a container from an image. The docker run command is a combination of the docker create and docker start commands. It creates a new container from the image specified and starts that container. if the docker image is not present, then the docker run pulls that.

```
Microsoft Windows [Version 10.0.26100.3837]
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C:\Users\Lokesh>docker run redis
Unable to find image 'redis:latest' locally
latest: Pulling from library/redis
c29f5b76f736: Pull complete
5de2dd3ff2ef: Pull complete
6c334acf232e: Pull complete
3890e1a50a6c: Pull complete
f5bc47c37726: Pull complete
20eea55b3ebb: Pull complete
4f4fb70ef54: Pull complete
d128ccd842a6: Pull complete
Digest: sha256:93a8d83b707d0d6a1b9186edecca2e37f83722ae0e398aee4eea0ff17c2fad0e
Status: Downloaded newer image for redis:latest
1:C 07 Feb 2025 10:58:29.870 * o080o080o080o Redis is starting o080o080o080o
1:C 07 Feb 2025 10:58:29.870 * Redis version=7.4.2, bits=64, commit=00000000, modified=0, pid=1, just started
1:C 07 Feb 2025 10:58:29.870 # Warning: no config file specified, using the default config. In order to specify a config file use redis-server /path/to/redis.conf
1:M 07 Feb 2025 10:58:29.870 * monotonic clock: POSIX clock_gettime
1:M 07 Feb 2025 10:58:29.871 * Running mode=standalone, port=6379.
1:M 07 Feb 2025 10:58:29.872 * Server initialized
1:M 07 Feb 2025 10:58:29.872 * Ready to accept connections tcp
1:signal-handler (1738926059) Received SIGTERM scheduling shutdown...
1:M 07 Feb 2025 11:00:59.299 * User requested shutdown...
1:M 07 Feb 2025 11:00:59.299 * Saving the final RDB snapshot before exiting.
1:M 07 Feb 2025 11:00:59.308 * DB saved on disk
1:M 07 Feb 2025 11:00:59.308 # Redis is now ready to exit, bye bye...
```

- ii. **Docker Pull**: This command allows you to pull any image which is present in the official registry of docker, Docker hub. By default, it pulls the latest image, but you can also mention the version of the image.

After successful execution:

```
Microsoft Windows [Version 10.0.26100.3837]
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C:\Users\Lokesh>docker run redis
Unable to find image 'redis:latest' locally
latest: Pulling from library/redis
c29f5b76f736: Pull complete
5de2dd3ff2ef: Pull complete
6c334acf232e: Pull complete
3890e1a50a6c: Pull complete
f5bc47c37726: Pull complete
20eea55b3ebb: Pull complete
4f4fb70ef54: Pull complete
d128ccd842a6: Pull complete
Digest: sha256:93a8d83b707d0d6a1b9186edecca2e37f83722ae0e398aee4eea0ff17c2fad0e
Status: Downloaded newer image for redis:latest
1:C 07 Feb 2025 10:58:29.870 * o080o080o080o Redis is starting o080o080o080o
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1:C 07 Feb 2025 10:58:29.870 # Warning: no config file specified, using the default config. In order to specify a config file use redis-server /path/to/redis.conf
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1:M 07 Feb 2025 10:58:29.872 * Server initialized
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1:signal-handler (1738926059) Received SIGTERM scheduling shutdown...
1:M 07 Feb 2025 11:00:59.299 * User requested shutdown...
1:M 07 Feb 2025 11:00:59.299 * Saving the final RDB snapshot before exiting.
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```

iii. Docker ps command: This command (by default) shows us a list of all the running containers. We can use various flags with it.

- -a flag: shows us all the containers, stopped or running.
- -l flag: shows us the latest container.
- -q flag: shows only the Id of the containers

```
Windows PowerShell
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PS C:\Users\Lokesh> docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
09aa0df450f7	redis	"docker-entrypoint.s..."	About a minute ago	Up About a minute	6379/tcp	sweet_curie

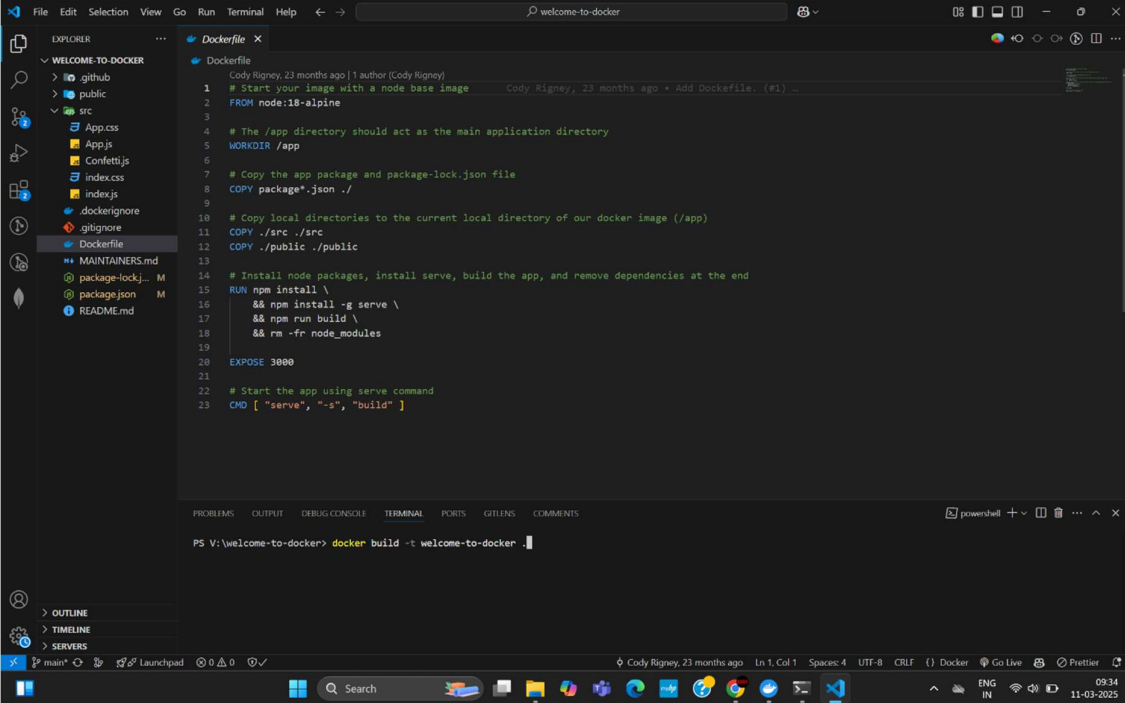
iv. Docker Stop: This command allows you to stop a container if it has crashed or you want to switch to another one.

Format: docker stop <container_ID>

```
Stop one or more running containers
PS C:\Users\Lokesh> docker stop 09aa0df450f7
09aa0df450f7
PS C:\Users\Lokesh> docker start 09aa0df450f7
09aa0df450f7
```

v. Docker Start : Suppose you want to start the stopped container again, you can do it with the help of this command.

Format: `docker start <container_ID>`



The screenshot shows a Visual Studio Code editor with a Dockerfile open. The Dockerfile contains the following content:

```
1 # Start your image with a node base image
2 FROM node:18-alpine
3
4 # The /app directory should act as the main application directory
5 WORKDIR /app
6
7 # Copy the app package and package-lock.json file
8 COPY package*.json ./
9
10 # Copy local directories to the current local directory of our docker image (/app)
11 COPY ./src ./src
12 COPY ./public ./public
13
14 # Install node packages, install serve, build the app, and remove dependencies at the end
15 RUN npm install \
16     && npm install -g serve \
17     && npm run build \
18     && rm -fr node_modules
19
20 EXPOSE 3000
21
22 # Start the app using serve command
23 CMD [ "serve", "-s", "build" ]
```

Below the editor, a terminal window shows the command `docker build -t welcome-to-docker` being executed in a PowerShell prompt.

vi. `Docker rm`: To delete a container. By default when a container is created, it gets an ID as well as an imaginary name such as `confident_boyd`, `heuristic_villani`, etc. You can either mention the container name or its ID.

Some important flags:

- f flag: remove the container forcefully.
- v flag: remove the volumes.
- l flag: remove the specific link mentioned.

Format: `$ docker rm {options} <container_name or ID>`



The screenshot shows a terminal window with the following text:

```
PS C:\Users\Lokesh> docker rm 09aa0df450f7
Error response from daemon: cannot remove container "/sweet_curie": container is running: stop the container before removing or force remove
```

vii. Docker Images: Lists all the pulled images which are present on our system.

