TASK 2: BASED ON BOTH DOCKER SESSIONS

A brief introduction about Docker:

Docker is an open-source platform that allows you to create, deploy, and manage containerized applications. Docker streamlines and predicts development.

Docker automates boring configuration processes and is utilised across the development lifecycle for fast, easy, and portable desktop and cloud application development. Docker's end-to-end platform comprises UIs, CLIs, APIs, and security that are all designed to function together across the application delivery lifecycle.

TASK 2.1: The compose should deploy two services (web and DB), and each service should deploy a container as per details below:

For web service: --->> php:rc-apache

a. Container name must be php_web.
b. Use image php with any apache tag.
c. Map php_web container's port 80 with host port 6000
d. Map php_web container's /var/www/html volume with host volume /var/www/html.

For DB service:

a. Container name must be mysql_web.
b. Use image mariadb with any tag (preferably latest).

c. Map mysql_web container's port 3306 with host port 3306
d. Map mysql_web container's /var/lib/mysql volume with host volume /var/lib/mysql.
e. Set MYSQL_DATABASE=database_web and use any custom user (except root) with some complex password for DB connections.

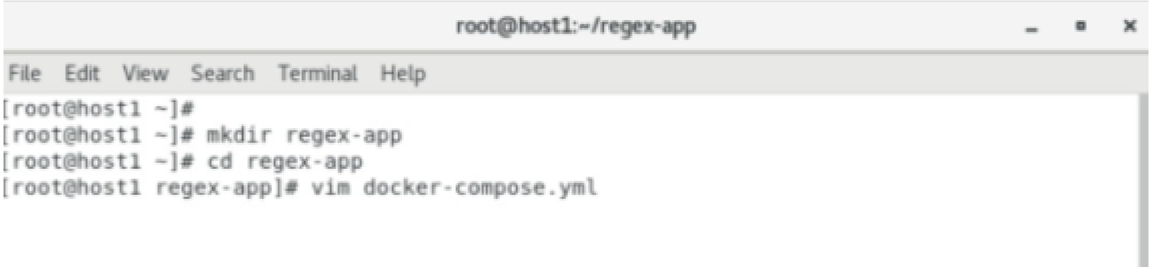
After running docker-compose up you can access the app with curl command
curl <server-ip or hostname>:6000/

Solution:

Commands used:

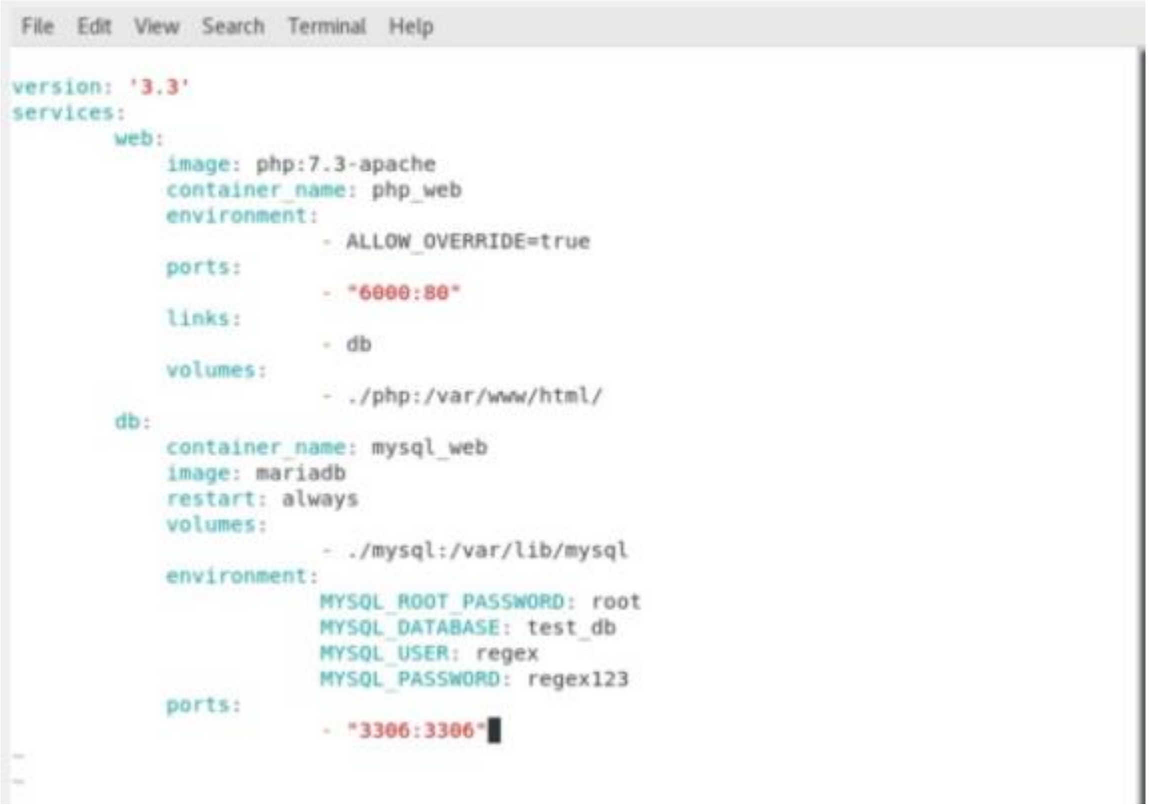
1. cd php
2. vim docker-compose.yml
3. vim Dockerfile
4. vim index.php
5. docker-compose up
6. docker-compose stop
7. docker-compose up –d
8. docker-compose ps
9. ifconfig enp0s3 | grep inet
10. curl 192.168.0.103:6000

1) create a docker-compose file using vim, edit the Docker-compose file, the first section to define web portion and the second section defines the database.



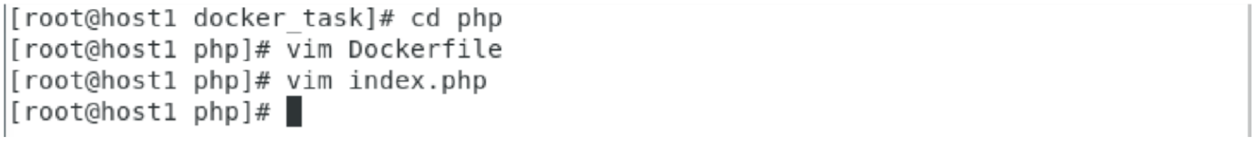
```
[root@host1 ~]#
[root@host1 ~]# mkdir regex-app
[root@host1 ~]# cd regex-app
[root@host1 regex-app]# vim docker-compose.yml
```

Docker-compose.yml

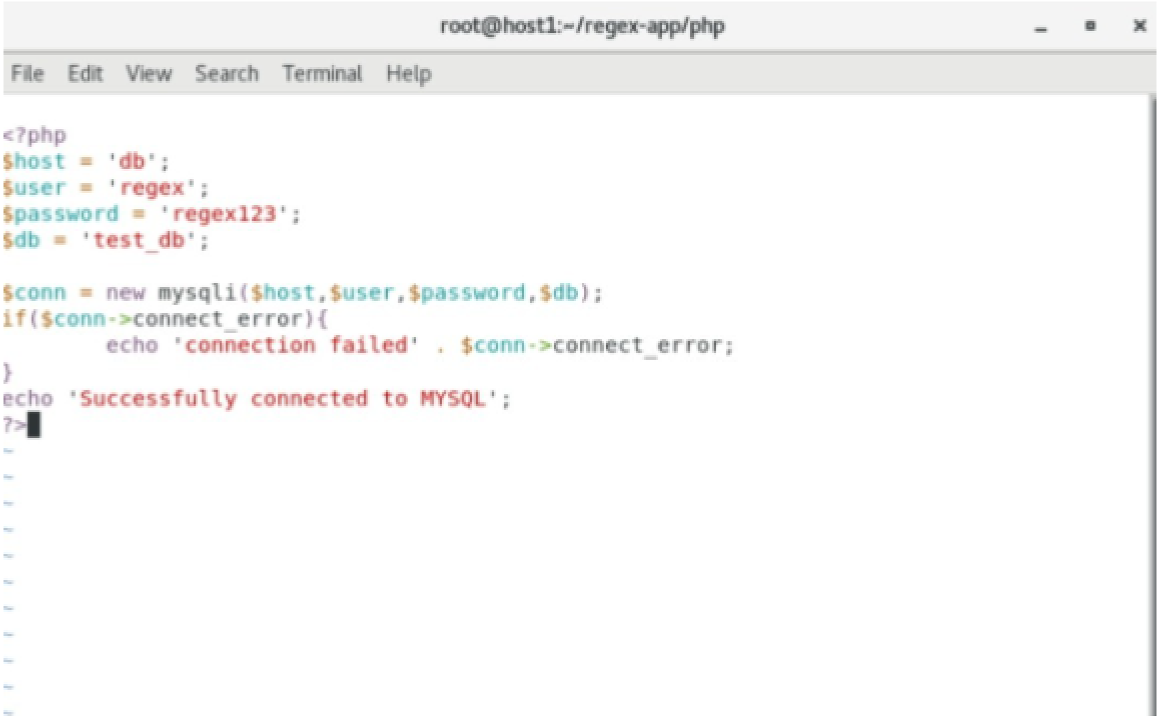


```
version: '3.3'
services:
        web:
            image: php:7.3-apache
            container_name: php_web
            environment:
                        - ALLOW_OVERRIDE=true
            ports:
                        - "6000:80"
            links:
                        - db
            volumes:
                        - ./php:/var/www/html/
        db:
            container_name: mysql_web
            image: mariadb
            restart: always
            volumes:
                        - ./mysql:/var/lib/mysql
            environment:
                        MYSQL_ROOT_PASSWORD: root
                        MYSQL_DATABASE: test_db
                        MYSQL_USER: regex
                        MYSQL_PASSWORD: regex123
            ports:
                        - "3306:3306"
~
~
```

2) Creating the index.php ,editing the file and adding credentials for mysql



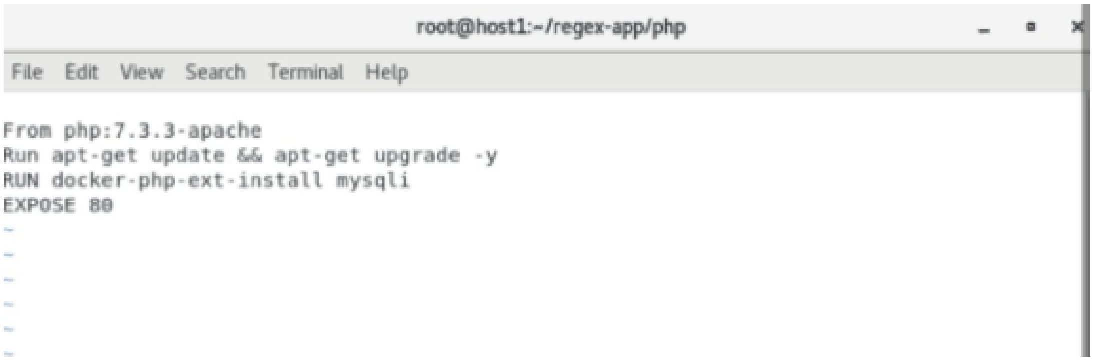
```
[root@host1 docker_task]# cd php
[root@host1 php]# vim Dockerfile
[root@host1 php]# vim index.php
[root@host1 php]# 
```


root@host1:~/regex-app/php
File Edit View Search Terminal Help

```
<?php
$host = 'db';
$user = 'regex';
$password = 'regex123';
$db = 'test_db';

$conn = new mysqli($host,$user,$password,$db);
if($conn->connect_error){
        echo 'connection failed' . $conn->connect_error;
}
echo 'Successfully connected to MYSQL';
?>
~
~
~
~
~
~
~
~
~
~
~
```

3) Creating Docker file using vim, editing the file by putting some specific keywords that dictate how to build a specific image

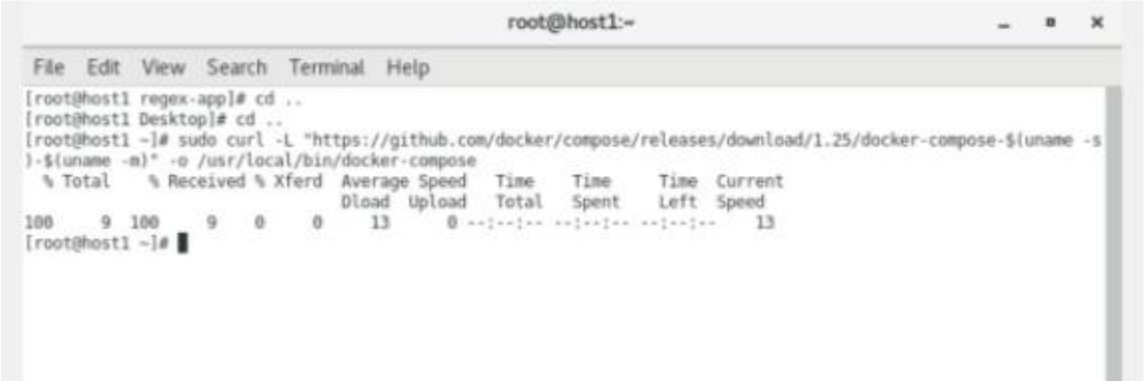
Docker file :


root@host1:~/regex-app/php
File Edit View Search Terminal Help

```
From php:7.3.3-apache
Run apt-get update && apt-get upgrade -y
RUN docker-php-ext-install mysqli
EXPOSE 80
~
~
~
~
~
~
```

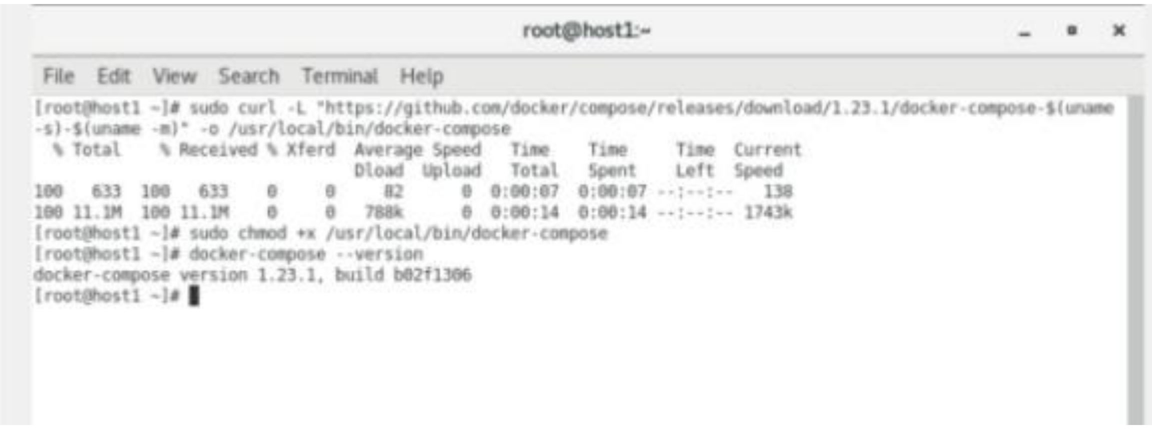
4) Install Docker compose for project

Index.php



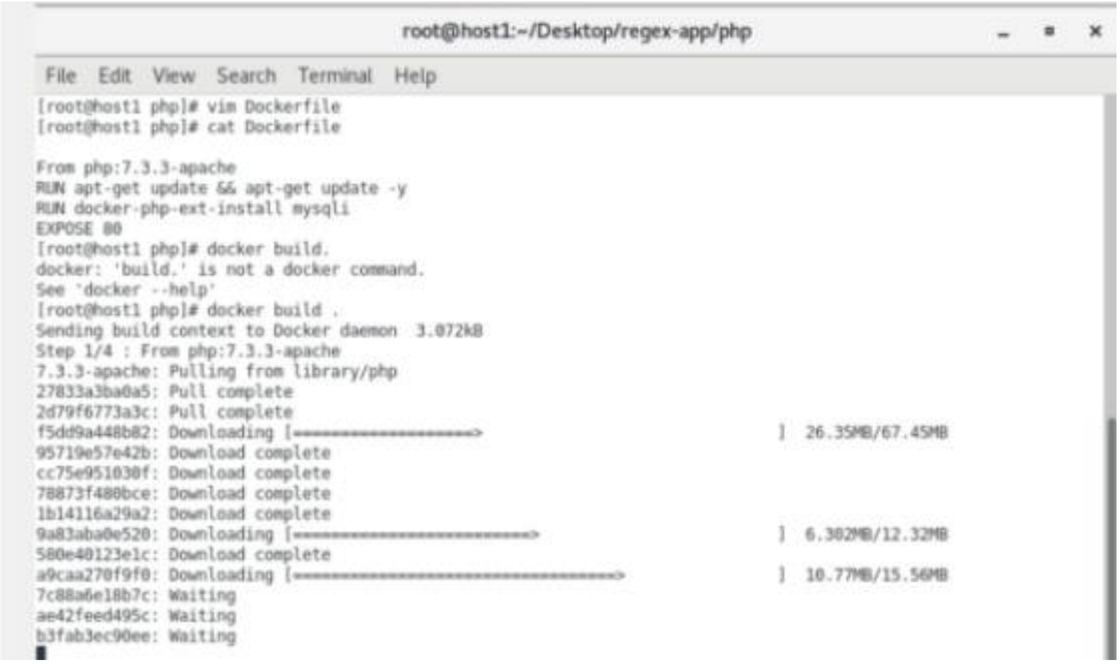
```
[root@host1 regex-app]# cd ..
[root@host1 Desktop]# cd ..
[root@host1 ~]# sudo curl -L "https://github.com/docker/compose/releases/download/1.25/docker-compose-$(uname -s
)-$(uname -m)" -o /usr/local/bin/docker-compose
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100     9  100     9    0     0     13      0 --:--:-- --:--:-- --:--:--    13
[root@host1 ~]# █
```

5) Changing the file mode(action)



```
[root@host1 ~]# sudo curl -L "https://github.com/docker/compose/releases/download/1.23.1/docker-compose-$(uname
-s)-$(uname -m)" -o /usr/local/bin/docker-compose
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   633  100   633    0     0     82      0  0:00:07  0:00:07 --:--:--   138
100 11.1M  100 11.1M    0     0   788k      0  0:00:14  0:00:14 --:--:-- 1743k
[root@host1 ~]# sudo chmod +x /usr/local/bin/docker-compose
[root@host1 ~]# docker-compose --version
docker-compose version 1.23.1, build b02f1306
[root@host1 ~]# █
```

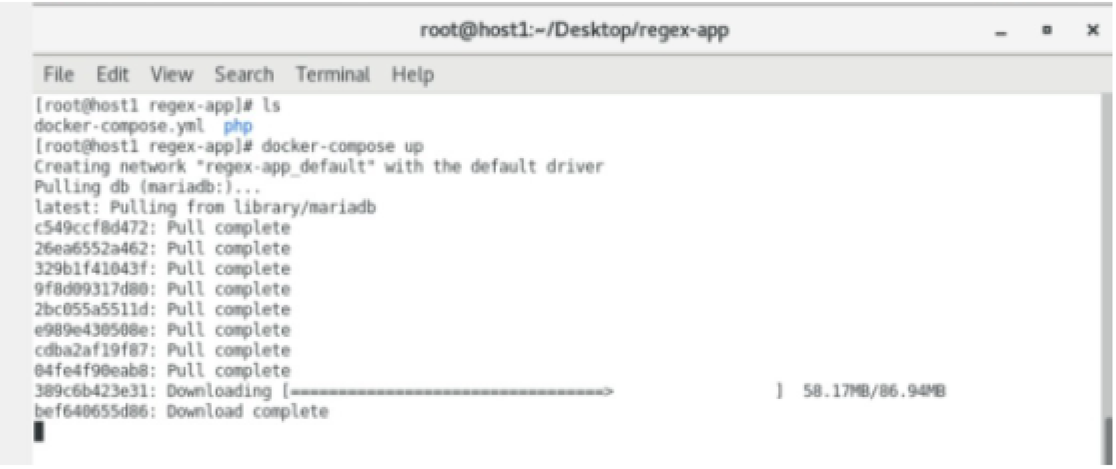
6) Building the container (Docker container)



root@host1:~/Desktop/regex-app/php
File Edit View Search Terminal Help

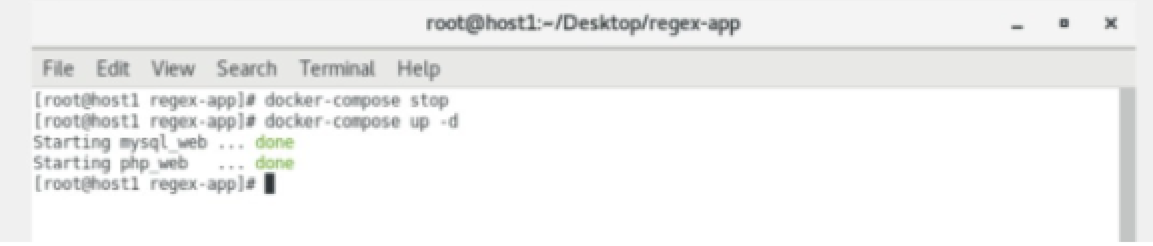
```
[root@host1 php]# vim Dockerfile
[root@host1 php]# cat Dockerfile

From php:7.3.3-apache
RUN apt-get update && apt-get update -y
RUN docker-php-ext-install mysqli
EXPOSE 80
[root@host1 php]# docker build.
docker: 'build.' is not a docker command.
See 'docker --help'
[root@host1 php]# docker build .
Sending build context to Docker daemon  3.072kB
Step 1/4 : From php:7.3.3-apache
7.3.3-apache: Pulling from library/php
27833a3ba0a5: Pull complete
2d79f6773a3c: Pull complete
f5dd9a448b82: Downloading [==================>                                ]  26.35MB/67.45MB
95719e57e42b: Download complete
cc75e951030f: Download complete
78873f480bce: Download complete
1b14116a29a2: Download complete
9a83aba0e520: Downloading [========================>                          ]  6.302MB/12.32MB
580e40123e1c: Download complete
a9caa270f9f0: Downloading [==================================>                ]  10.77MB/15.56MB
7c88a6e18b7c: Waiting
ae42feed495c: Waiting
b3fab3ec90ee: Waiting
█
```

7) Using Docker-compose-up to aggregate the output of each container

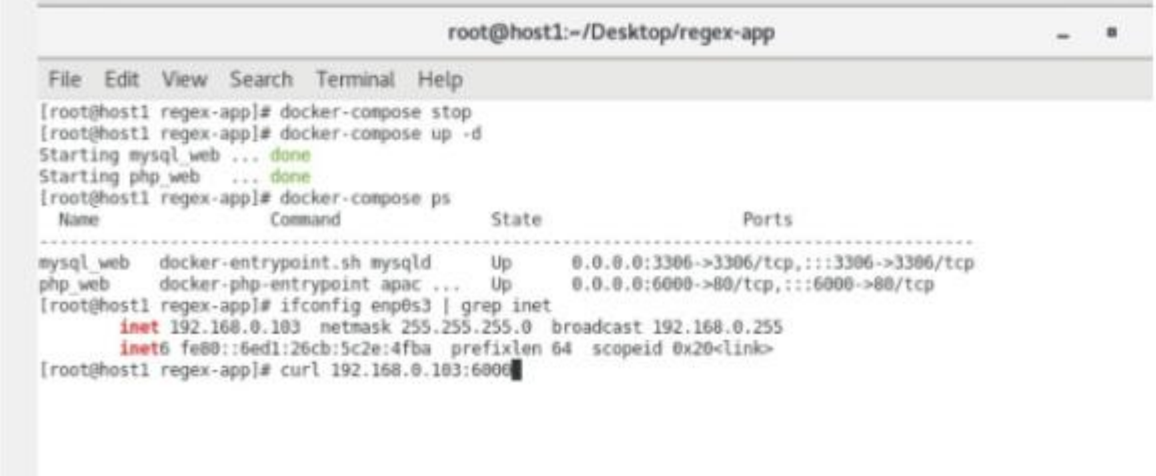


```
[root@host1 regex-app]# ls
docker-compose.yml  php
[root@host1 regex-app]# docker-compose up
Creating network "regex-app_default" with the default driver
Pulling db (mariadb:)...
latest: Pulling from library/mariadb
c549ccf8d472: Pull complete
26ea6552a462: Pull complete
329b1f41043f: Pull complete
9f8d09317d80: Pull complete
2bc055a5511d: Pull complete
e989e430508e: Pull complete
cdba2af19f87: Pull complete
04fe4f90eab8: Pull complete
389c6b423e31: Downloading [==================================>                 ]  58.17MB/86.94MB
bef640655d86: Download complete
█
```

8) Using *docker-compose up -d* command for detached mode



```
[root@host1 regex-app]# docker-compose stop
[root@host1 regex-app]# docker-compose up -d
Starting mysql_web ... done
Starting php_web   ... done
[root@host1 regex-app]# █
```



```
[root@host1 regex-app]# docker-compose stop
[root@host1 regex-app]# docker-compose up -d
Starting mysql_web ... done
Starting php_web   ... done
[root@host1 regex-app]# docker-compose ps
  Name               Command               State                    Ports
-------------------------------------------------------------------------------------------
mysql_web   docker-entrypoint.sh mysqld      Up      0.0.0.0:3306->3306/tcp,:::3306->3306/tcp
php_web     docker-php-entrypoint apac ...   Up      0.0.0.0:6000->80/tcp,:::6000->80/tcp
[root@host1 regex-app]# ifconfig enp0s3 | grep inet
        inet 192.168.0.103  netmask 255.255.255.0  broadcast 192.168.0.255
        inet6 fe80::6ed1:26cb:5c2e:4fba  prefixlen 64  scopeid 0x20<link>
[root@host1 regex-app]# curl 192.168.0.103:6000█
```

TASK2.2: Dockerfile

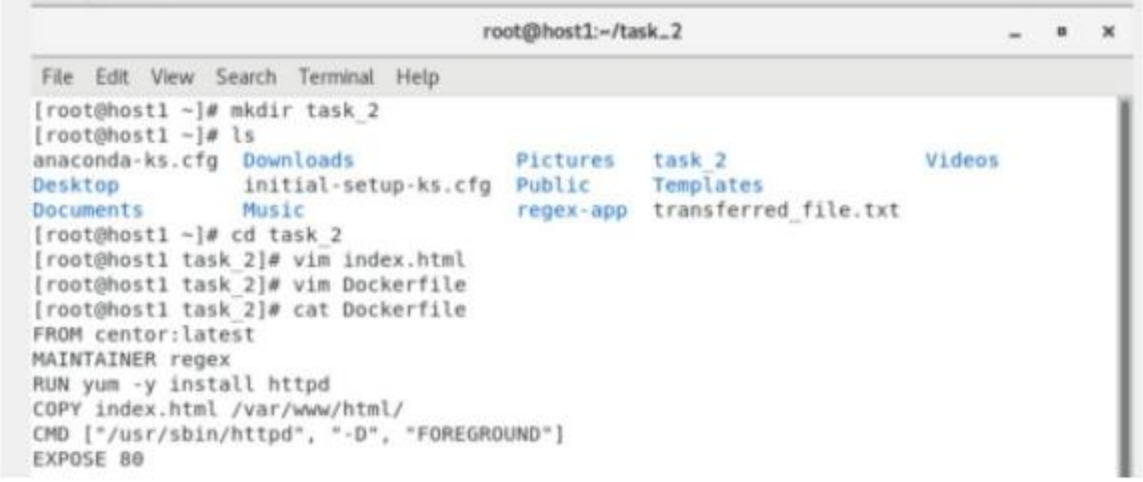
1) Webserver
2) This is coming from Docker ---> Content
3) CentOS

Solution:

Commands used**:**

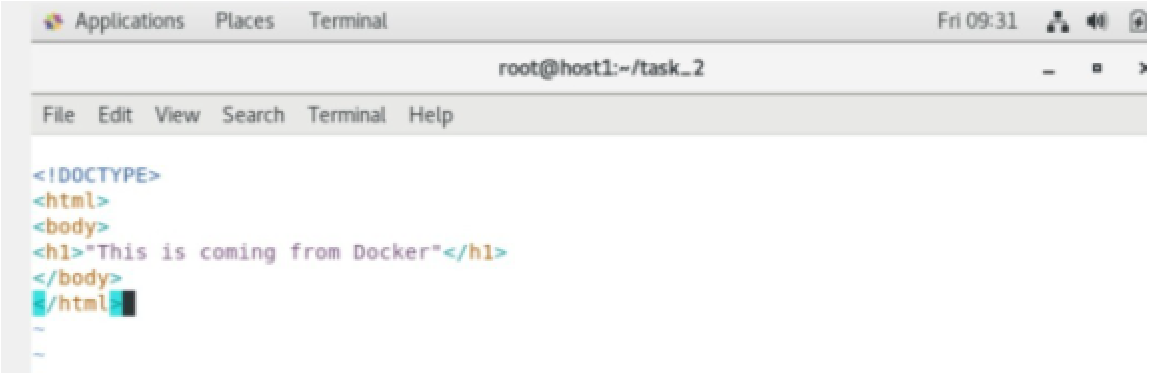
1. mkdir docker_task2.1
2. cd docker_task2.1
3. vim index.html
4. vim Dockerfile
5. systemctl start docker 6. docker build –t webserver .

1) Creating a new directory and getting into the directory. Next creating an index.html file and docker file that will include the specific keyword that dictates how to build a specific image.



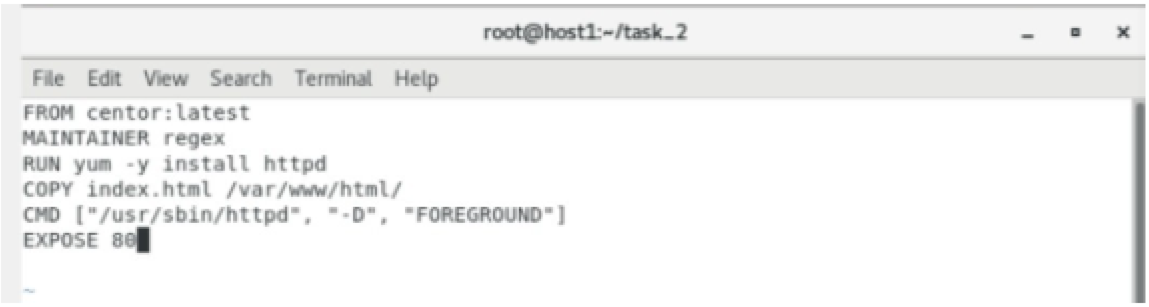
```
[root@host1 ~]# mkdir task_2
[root@host1 ~]# ls
anaconda-ks.cfg  Downloads              Pictures   task_2              Videos
Desktop          initial-setup-ks.cfg  Public     Templates
Documents        Music                  regex-app  transferred_file.txt
[root@host1 ~]# cd task_2
[root@host1 task_2]# vim index.html
[root@host1 task_2]# vim Dockerfile
[root@host1 task_2]# cat Dockerfile
FROM centor:latest
MAINTAINER regex
RUN yum -y install httpd
COPY index.html /var/www/html/
CMD ["/usr/sbin/httpd", "-D", "FOREGROUND"]
EXPOSE 80
```

Index.html



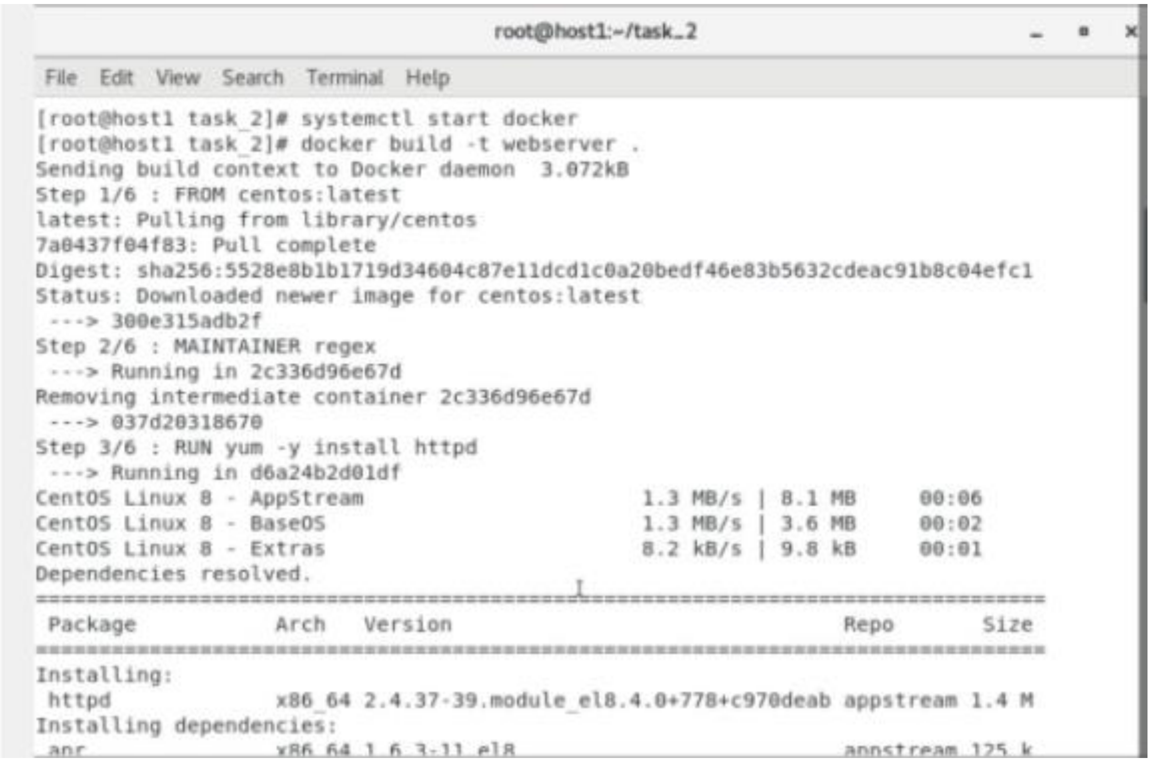
```
<!DOCTYPE>
<html>
<body>
<h1>"This is coming from Docker"</h1>
</body>
</html>
~
~
```

Docker file



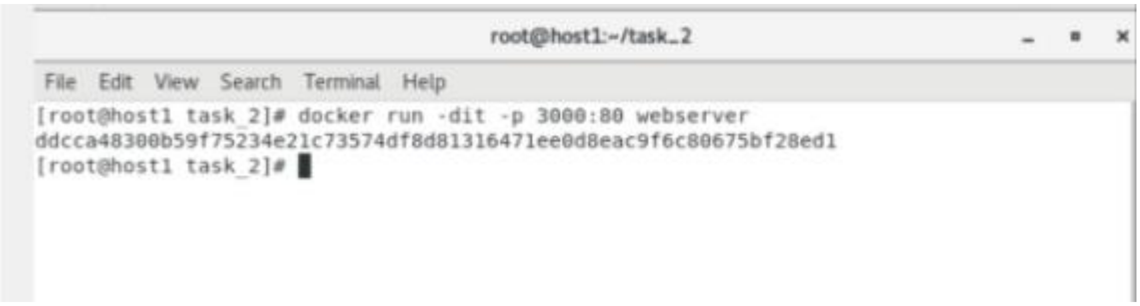
```
FROM centor:latest
MAINTAINER regex
RUN yum -y install httpd
COPY index.html /var/www/html/
CMD ["/usr/sbin/httpd", "-D", "FOREGROUND"]
EXPOSE 80

~
```

2) Starting the docker service and creating the docker image inside the Docker file.



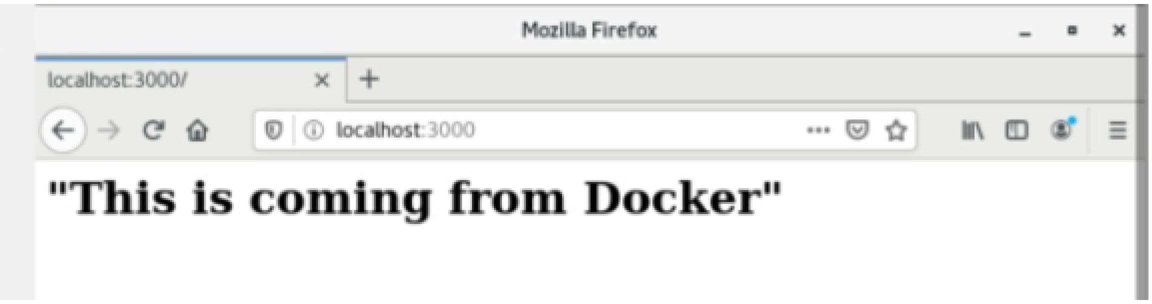
```
[root@host1 task_2]# systemctl start docker
[root@host1 task_2]# docker build -t webserver .
Sending build context to Docker daemon  3.072kB
Step 1/6 : FROM centos:latest
latest: Pulling from library/centos
7a0437f04f83: Pull complete
Digest: sha256:5528e8b1b1719d34604c87e11dcd1c0a20bedf46e83b5632cdeac91b8c04efc1
Status: Downloaded newer image for centos:latest
 ---> 300e315adb2f
Step 2/6 : MAINTAINER regex
 ---> Running in 2c336d96e67d
Removing intermediate container 2c336d96e67d
 ---> 037d20318670
Step 3/6 : RUN yum -y install httpd
 ---> Running in d6a24b2d01df
CentOS Linux 8 - AppStream                      1.3 MB/s | 8.1 MB     00:06
CentOS Linux 8 - BaseOS                         1.3 MB/s | 3.6 MB     00:02
CentOS Linux 8 - Extras                         8.2 kB/s | 9.8 kB     00:01
Dependencies resolved.
================================================================================
 Package           Arch   Version                                 Repo      Size
================================================================================
Installing:
 httpd             x86_64 2.4.37-39.module_el8.4.0+778+c970deab appstream 1.4 M
Installing dependencies:
 apr               x86_64 1.6.3-11.el8                            appstream 125 k
```

- Setting the webserver *"docker run –dit -p 3000:80*"



```
[root@host1 task_2]# docker run -dit -p 3000:80 webserver
ddcca48300b59f75234e21c73574df8d81316471ee0d8eac9f6c80675bf28ed1
[root@host1 task_2]# █
```

3) Go to the web browser and check localhost:3000



"This is coming from Docker"