

S_Docker_03 Docker Network, Volume And Docker Compose

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DOCKER – DEVOPS



S_Docker_03 Docker Network, Volume And Docker Compose: Lab 3

Problem 1:

- Create bridge network with subnet 192.168.0.0/24.
- Run 2 containers and attach containers to this network.
- Create another bridge network with subnet 10.5.0.0/24.
- Run any container and attach it to the new network.
- Make sure that the containers at different network can't ping each other

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Activities Terminal May 31 7:12 PM
kdawoud@k: ~

kdawoud@k:~$ docker network create --driver bridge --subnet 192.168.0.0/24 network_1
unknown flag: --driver
See 'docker network create --help'.
kdawoud@k:~$ docker network create --driver bridge --subnet 192.168.0.0/24 network_1
46e4abd0cb16a54ed97991b637f0dcf1f08ad216b0aed524f04e6330da0b38d
kdawoud@k:~$ docker ps -a
CONTAINER ID        IMAGE               COMMAND                  CREATED              STATUS              PORTS              NAMES
f0f0391d1d6e        mysql:latest       "docker-entrypoint.s..." 45 hours ago        Exited (1) 45 hours ago              mysql-db2
b70eeF40b86e        mysql:latest       "docker-entrypoint.s..." 45 hours ago        Exited (1) 45 hours ago              mysql-db1
fd6f14378da5        node_task          "docker-entrypoint.s..." 46 hours ago        Exited (0) 46 hours ago              gracious_kalam
9631408929f7       mysql:latest       "docker-entrypoint.s..." 47 hours ago        Exited (1) 47 hours ago              mysql-db
fc2e93a0d8fc       kodekloud/simple-webapp "python app.py"          3 days ago          Exited (137) 46 hours ago            blue-apip
009b4b5554f66       kodekloud/simple-webapp "python app.py"          3 days ago          Created
f19ab32f9543       ubuntu             "/bin/bash"              3 days ago          Exited (0) 3 days ago              blue-app
a6796c70fb70       nginx:alpine       "/docker-entrypoint..." 4 days ago          Exited (0) 3 days ago              busy_lalande
kdawoud@k:~$ docker run -d --network network_1 nginx:alpine
eee0b5c969abb91d4ce4d52d26abec1652663b529717f946a6aed8486e4728e1d
kdawoud@k:~$ docker run -d --network network_1 ubuntu
b3eaaa54f3f83bbaeecd6a636f27ad5d3c7a05a99992f77a9e87b362787404a
kdawoud@k:~$ docker ps
CONTAINER ID        IMAGE               COMMAND                  CREATED              STATUS              PORTS              NAMES
eee0b5c969ab       nginx:alpine       "/docker-entrypoint..." 20 seconds ago      Up 18 seconds      80/tcp            eager_keldysh
kdawoud@k:~$ docker run -d --network network_1 ginx:alpine
Unable to find image 'ginx:alpine' locally
docker: Error response from daemon: pull access denied for ginx, repository does not exist or may require 'docker login': denied: requested access to the resource is denied.
See 'docker run --help'.
kdawoud@k:~$ docker run -d --network network_1 mysql:latest
7996030482f758ca35380edd2e008876243da31d59a7702c4ac9a83ec1b83
kdawoud@k:~$ docker ps
CONTAINER ID        IMAGE               COMMAND                  CREATED              STATUS              PORTS              NAMES
eee0b5c969ab       nginx:alpine       "/docker-entrypoint..." About a minute ago   Up About a minute   80/tcp            eager_keldysh
kdawoud@k:~$ docker run -d --network network_1 nginx:alpine
ee3ed5cbbbed8f9f1dca873c90b5960024f1b7f08be3baa41235e7ff57733133
kdawoud@k:~$ docker ps
CONTAINER ID        IMAGE               COMMAND                  CREATED              STATUS              PORTS              NAMES
ee3ed5cbbbed8       nginx:alpine       "/docker-entrypoint..." 4 seconds ago       Up 2 seconds       80/tcp            hardcore_ferni
eee0b5c969ab       nginx:alpine       "/docker-entrypoint..." About a minute ago   Up About a minute   80/tcp            eager_keldysh
kdawoud@k:~$ docker network create --driver bridge --subnet 10.5.0.0/24 network_2
eb571284a1726490f578907c2ef448165f6a79f1b2c5564a426f0a534085e3e7
kdawoud@k:~$ docker network ls
NETWORK ID          NAME                DRIVER              SCOPE
43f87993f62d       bridge             bridge             local
2fd9a9014be4       host               host               local
46e4abd0cb16a54ed9 network_1           bridge            local
eb571284a1726490 network_2           bridge            local
e8dc9e6fb85b       none              null               local
kdawoud@k:~$

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Activities Terminal May 31 7:22 PM
kdawoud@k: ~

},
"NetworkSettings": {
  "Bridge": "",
  "SandboxID": "f61d02ce9c3820a250d48f76ed483ef39bd39eca5f216a7dc954fccc23f2eb8d",
  "HairpinMode": false,
  "LinkLocalIPv6Address": "",
  "LinkLocalIPv6PrefixLen": 0,
  "Ports": {
    "80/tcp": null
  },
  "SandboxKey": "/var/run/docker/netns/f61d02ce9c38",
  "SecondaryIPAddresses": null,
  "SecondaryIPv6Addresses": null,
  "EndpointID": "",
  "Gateway": "",
  "GlobalIPv6Address": "",
  "GlobalIPv6PrefixLen": 0,
  "IPAddress": "",
  "IPPrefixLen": 0,
  "IPv6Gateway": "",
  "MacAddress": "",
  "Networks": {
    "network 2": {
      "IPAMConfig": null,
      "Links": null,
      "Aliases": [
        "75f47455866f"
      ],
      "NetworkID": "eb571284a1726490f578907c2ef448165f6a79f1b2c5564a426f0a534085e3e7",
      "EndpointID": "c395553a23f5c9d591ba6cac907efe9f28e4a39b98b534c3beedcd25a425e7bd",
      "Gateway": "10.5.0.1",
      "IPAddress": "10.5.0.2",
      "IPPrefixLen": 24,
      "IPv6Gateway": "",
      "GlobalIPv6Address": "",
      "GlobalIPv6PrefixLen": 0,
      "MacAddress": "02:42:0a:05:00:02",
      "DriverOpts": null
    }
  }
}
}
}
kdawoud@k:~$ docker ps
CONTAINER ID        IMAGE               COMMAND                  CREATED              STATUS              PORTS              NAMES
75f47455866f       nginx:alpine       "/docker-entrypoint..." 5 minutes ago       Up 5 minutes       80/tcp            modest_mahavira
ee3ed5cbbbed8       nginx:alpine       "/docker-entrypoint..." 8 minutes ago       Up 8 minutes       80/tcp            hardcore_ferni
eee0b5c969ab       nginx:alpine       "/docker-entrypoint..." 10 minutes ago      Up 10 minutes      80/tcp            eager_keldysh
kdawoud@k:~$ docker exec -it ee3ed5cbbbed8 ping 10.5.0.2
PING 10.5.0.2 (10.5.0.2): 56 data bytes
^C
--- 10.5.0.2 ping statistics ---
53 packets transmitted, 0 packets received, 100% packet loss
kdawoud@k:~$

```

Problem 2:

- Create static html file
- Write Dockerfile to build image based on httpd to host the html file and specify the following:
 - Copy the html file.
 - Copy a new configuration file to listen on port 9999 instead of 80
 - Open the port 9999 in the container
 - Add environment variable CONTAINER with value docker .
 - Add startup command to echo the variable

```
Activities Terminal May 31 11:42 PM
kdawoud@k: ~/apache-html

kdawoud@k: ~/apache-html
kdawoud@k:~/apache-html$ ls
Dockerfile index.html local-httpd.conf
kdawoud@k:~/apache-html$ cat Dockerfile
FROM httpd:2.4

COPY index.html /usr/local/apache2/htdocs
COPY local-httpd.conf /usr/local/apache2/conf/httpd.conf

EXPOSE 9999

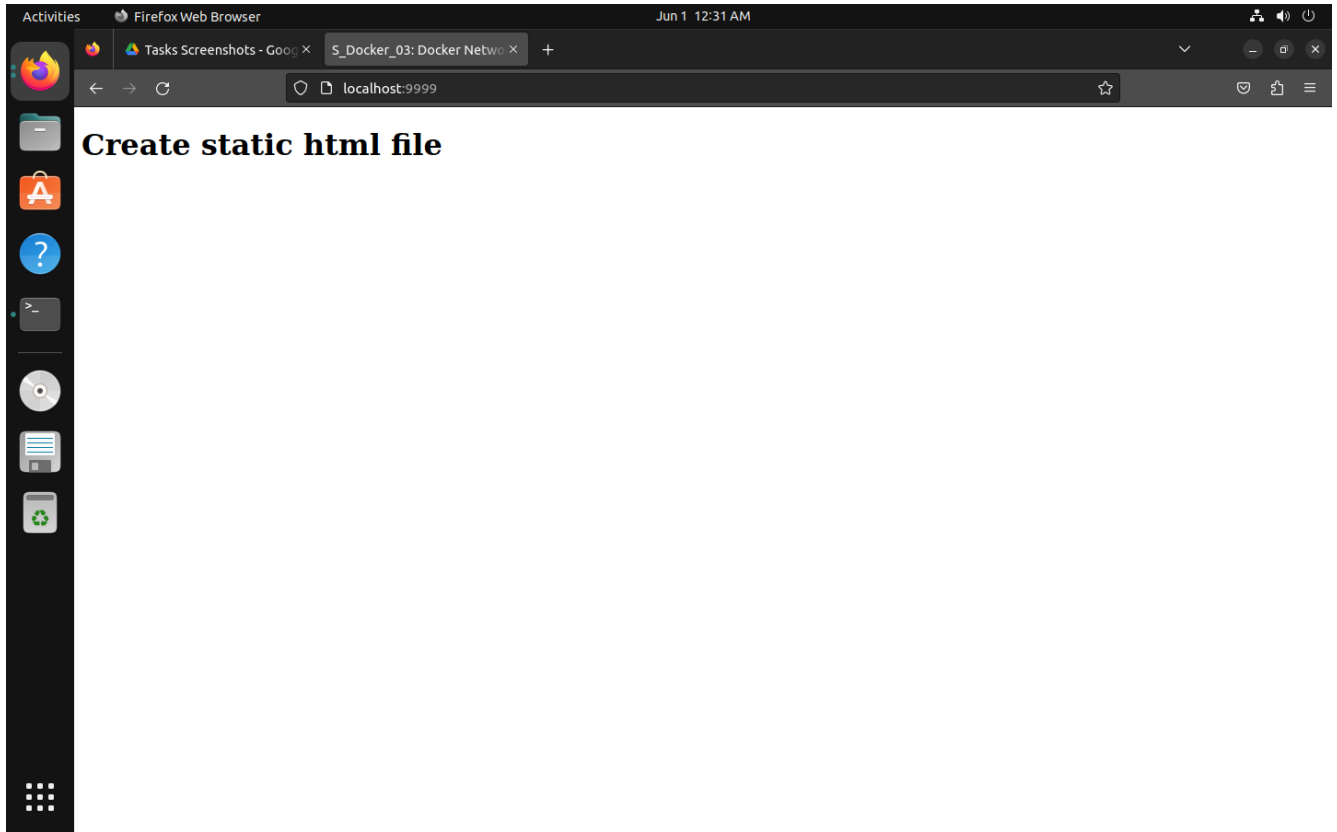
ENV CONTAINER=docker

ENTRYPOINT echo The container is up and running from $CONTAINER

kdawoud@k:~/apache-html$ cat local-httpd.conf
#
# This is the main Apache HTTP server configuration file. It contains the
# configuration directives that give the server its instructions.
# See <URL:http://httpd.apache.org/docs/2.4/> for detailed information.
# In particular, see
# <URL:http://httpd.apache.org/docs/2.4/mod/directives.html>
# for a discussion of each configuration directive.
#
# Do NOT simply read the instructions in here without understanding
# what they do. They're here only as hints or reminders. If you are unsure
# consult the online docs. You have been warned.
#
# Configuration and logfile names: If the filenames you specify for many
# of the server's control files begin with "/" (or "drive:/") for Win32), the
# server will use that explicit path. If the filenames do "not" begin
# with "/", the value of ServerRoot is prepended -- so "logs/access.log"
# with ServerRoot set to "/usr/local/apache2" will be interpreted by the
# server as "/usr/local/apache2/logs/access.log", whereas "/logs/access_log"
# will be interpreted as '/logs/access_log'.
#
# ServerRoot: The top of the directory tree under which the server's
# configuration, error, and log files are kept.
#
# Do not add a slash at the end of the directory path. If you point
# ServerRoot at a non-local disk, be sure to specify a local disk on the
# Mutex directive, if file-based mutexes are used. If you wish to share the
# same ServerRoot for multiple httpd daemons, you will need to change at
# least PidFile.
#
ServerRoot "/usr/local/apache2"
#
# Mutex: Allows you to set the mutex mechanism and mutex file directory
# for individual mutexes, or change the global defaults
#
```

```
Activities Terminal May 31 11:44 PM
kdawoud@k: ~/apache-html

kdawoud@k: ~/apache-html
kdawoud@k:~/apache-html$ cat local-httpd.conf
#
# Mutex: Allows you to set the mutex mechanism and mutex file directory
# for individual mutexes, or change the global defaults
#
# Uncomment and change the directory if mutexes are file-based and the default
# mutex file directory is not on a local disk or is not appropriate for some
# other reason.
#
# Mutex default:logs
#
# Listen: Allows you to bind Apache to specific IP addresses and/or
# ports, instead of the default. See also the <VirtualHost>
# directive.
#
# Change this to listen on specific IP addresses as shown below to
# prevent Apache from glomming onto all bound IP addresses.
#
#Listen 12.34.56.78:80
Listen 9999
#
# Dynamic Shared Object (DSO) Support
#
# To be able to use the functionality of a module which was built as a DSO you
# have to place corresponding 'LoadModule' lines at this location so the
# directives contained in it are actually available _before_ they are used.
# Statically compiled modules (those listed by 'httpd -l') do not need
# to be loaded here.
#
# Example:
# LoadModule foo_module modules/mod_foo.so
#
LoadModule mpm_event_module modules/mod_mpm_event.so
LoadModule mpm_prefork_module modules/mod_mpm_prefork.so
LoadModule mpm_worker_module modules/mod_mpm_worker.so
LoadModule authn_file_module modules/mod_authn_file.so
LoadModule authn_dbm_module modules/mod_authn_dbm.so
LoadModule authn_anon_module modules/mod_authn_anon.so
LoadModule authn_dbd_module modules/mod_authn_dbd.so
LoadModule authn_socache_module modules/mod_authn_socache.so
LoadModule authn_core_module modules/mod_authn_core.so
LoadModule authz_host_module modules/mod_authz_host.so
LoadModule authz_groupfile_module modules/mod_authz_groupfile.so
LoadModule authz_user_module modules/mod_authz_user.so
LoadModule authz_dbm_module modules/mod_authz_dbm.so
LoadModule authz_owner_module modules/mod_authz_owner.so
LoadModule authz_dbd_module modules/mod_authz_dbd.so
LoadModule authz_core_module modules/mod_authz_core.so
LoadModule authnz_ldap_module modules/mod_authnz_ldap.so
LoadModule authnz_fcgi_module modules/mod_authnz_fcgi.so
LoadModule access_compat_module modules/mod_access_compat.so
```



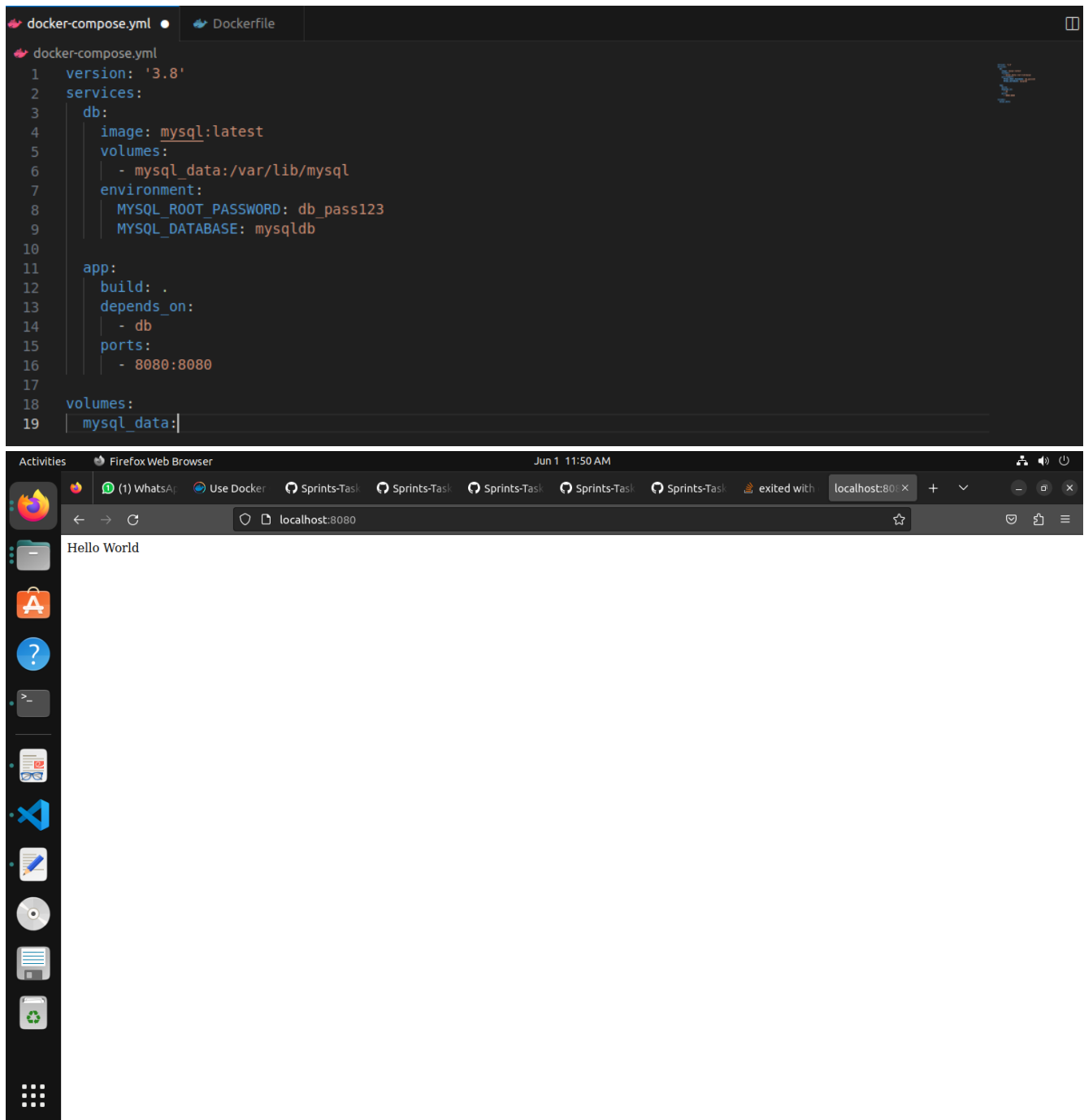
Problem 3:

- Create a docker compose to up mysql container, and <https://github.com/sabreensalama/dockerize-node-app-task> which depend on mysqldb.
- Add volume for mysqldb

```
Activities Terminal Jun 1 11:51 AM
kdawoud@k: ~/docker-compose

kdawoud@k:~/docker-compose$
kdawoud@k:~/docker-compose$ ls
docker-compose.yml Dockerfile package.json README.md server.js
kdawoud@k:~/docker-compose$ docker-compose up
Creating volume "docker-compose_db_data" with default driver
Pulling db (mysql:8.0)...
8.0: Pulling from library/mysql
90e2fb2facff: Pull complete
ba60eb20fd5f: Pull complete
4f509402d469: Pull complete
496c2cfa6815: Pull complete
8ec1dfa9522c: Pull complete
6dec7ba896f8: Pull complete
dc9ff75362b0: Pull complete
73e4682f9014: Pull complete
9ffdeecd6fb6: Pull complete
a4346ccfb53f: Pull complete
434c13bc32de: Pull complete
Digest: sha256:d6164ff4855b9b3f2c7748c6ec564ccff841f79a7023db0f9293143481a44b6e
Status: Downloaded newer image for mysql:8.0
Building app
[+] Building 1.7s (9/9) FINISHED
=> [internal] load .dockerignore 0.0s
=> == transferring context: 2B 0.0s
=> [internal] load build definition from Dockerfile 0.0s
=> == transferring dockerfile: 154B 0.0s
=> [internal] load metadata for docker.io/library/node:16 1.5s
=> [1/5] FROM docker.io/library/node:16@sha256:2ed6bba040f9005db9785927689c0d9a9442ca2cf9a59dc52297d684285c094 0.0s
=> [internal] load build context 0.0s
=> == transferring context: 447B 0.0s
=> CACHED [2/5] COPY package.json ./ 0.0s
=> CACHED [3/5] RUN npm install 0.0s
=> [4/5] COPY . . 0.0s
=> == exporting to image 0.0s
=> == exporting layers 0.0s
=> == writing image sha256:e10251c35d05e886389d5531c437c9546da8d78896dd66535c77cec8536757a0 0.0s
=> == naming to docker.io/library/docker-compose_app 0.0s
WARNING: Image for service app was built because it did not already exist. To rebuild this image you must use `docker-compose build` or `docker-compose up --build`.
Creating docker-compose_db_1 ... done
Creating docker-compose_app_1 ... done
Attaching to docker-compose_db_1, docker-compose_app_1
db_1 | mysql: [Warning] Using a password on the command line interface can be insecure.
db_1 | MySQL Community Server 8.0.33-1.0 started
db_1 |
app_1 |
kdawoud@k:~/docker-compose$ docker ps -a
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS              NAMES
38ea8c7fd963       docker-compose_app "docker-entrypoint..." 3 minutes ago       Exited (137) About a minute ago       docker-compose_app_1
5249b3a04e2d       mysql:8.0          "docker-entrypoint..." 3 minutes ago       Exited (0) About a minute ago          docker-compose_db_1
fc2e93a0d8fc       kodekloud/simple-webapp "python app.py"      3 days ago         Exited (137) 2 days ago                blue-apip
f19ab32fd543       ubuntu             "/bin/bash"         4 days ago         Exited (0) 4 days ago                  busy_lalande
a6796e70fb70       nginx:alpine       "/docker-entrypoint..." 4 days ago         Exited (0) 3 days ago                  nginx

kdawoud@k:~/docker-compose$ docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
docker-compose_app  latest             e10251c35d05       3 minutes ago      915MB
nginx               alpine             fe7edaf8a8dc       7 days ago         41.4MB
mysql               8.0                05db07cd74c0       7 days ago         565MB
ubuntu              latest             3b418d7b466a       5 weeks ago        77.8MB
kodekloud/simple-webapp latest             c6e3cd9aae36       4 years ago        84.8MB
kdawoud@k:~/docker-compose$
```



Problem5:

- Use docker compose to deploy ghost platform (image: ghost:1-alpine)(Ghost is a free and open source blogging platform written in JavaScript)
- Use mysql database instead of sqlite.

