Exercise Three - Dockerize a Web application

Task 1: I downloaded the skeleton code give to us from brightspace. In that zip file was a docker-compose.yml, dockerfile, index and insert. I then opened up the docker compose file give to use and added the following as told in the practical pdf

container_name: db

    image: mysql:5.7

    ports:

   # <Port exposed> : < MySQL Port running inside container>

     - '9906:3306'

    restart: always

    environment:

      - MYSQL_ROOT_PASSWORD=MYSQL_ROOT_PASSWORD

      - MYSQL_DATABASE=MYSQL_DATABASE

      - MYSQL_USER=MYSQL_USER

      - MYSQL_PASSWORD=MYSQL_PASSWORD

container_name: sets the actual name of the container when it runs, rather than letting Docker Compose generate it.

image: mysql:5.7, sets the the image.

port is used to access the services running inside a Docker container. We open a host port to give us access to a corresponding open port inside the Docker container. Then all the requests that are made to the host port can be redirected into the Docker container.

Docker provides restart policies to control whether your containers start automatically when they exit, or when Docker restarts. The restart "always" policy will make containers always to be restarted if they stop, even if they completed successfully.

MYSQL_ROOT_PASSWORD - This variable is mandatory and specifies the password that will be set for the root superuser account.

MYSQL_USER, MYSQL_PASSWORD - These variables are used in conjunction to create a new user and to set that user's password.

MYSQL_DATABASE, resource creates and manages a database on a MySQL server.

```
C: > Users > waleed > AppData > Local > Temp > Temp1_Practical2_Ex3_Skeleton.zip > ex3 > 🐳 docker-compose.yml
1    version: '3.9'
2    services:
3        php-apache-environment:
4            container_name: php-apache
5            build:
6                context: .
7                dockerfile: Dockerfile
8            depends_on:
9                - db
10           volumes:
11               - ./php/src:/var/www/html/
12           ports:
13               - 8000:80
14       db:
15           container_name: db
16           image: mysql:5.7
17           ports:
18         # <Port exposed> : < MySQL Port running inside container>
19               - '9906:3306'
20           restart: always
21           environment:
22               - MYSQL_ROOT_PASSWORD=MYSQL_ROOT_PASSWORD
23               - MYSQL_DATABASE=MYSQL_DATABASEz
24               - MYSQL_USER=MYSQL_USER
25               - MYSQL_PASSWORD=MYSQL_PASSWORD
26       phpmyadmin:
27         TO BE COMPLETED
28
```

Task 2: I then edited the docker-compose.yml file more to create the image for the php admin, with the following characteristics told to us from the pdf file.

image: phpmyadmin

restart: always

ports:

<Port exposed> : < MySQL Port running inside container>

- '8080:80'

depends_on:

- db

environment:

- PMA_HOST=db

image: phpmyadmin, set the image.

depends_on: is a Docker Compose keyword to set the order in which services must start and stop.

PMA_HOST - define address/host name of the MySQL server

```
C: > Users > waleed > Desktop > PRACTICAL2_waleed_wazir_19396951 > ex3 > 🐳 docker-compose.yml
  1    version: '3.9'
  2    services:
  3        php-apache-environment:
  4            container_name: php-apache
  5            build:
  6                context: .
  7                dockerfile: Dockerfile
  8            depends_on:
  9                - db
 10            volumes:
 11                - ./php/src:/var/www/html/
 12            ports:
 13                - 8000:80
 14        db:
 15            container_name: db
 16            image: mysql:5.7
 17            ports:
 18          # <Port exposed> : < MySQL Port running inside container>
 19                - '9906:3306'
 20            restart: always
 21            environment:
 22                    - MYSQL_ROOT_PASSWORD=MYSQL_ROOT_PASSWORD
 23                    - MYSQL_DATABASE=MYSQL_DATABASEz
 24                    - MYSQL_USER=MYSQL_USER
 25                    - MYSQL_PASSWORD=MYSQL_PASSWORD
 26        phpmyadmin:
 27          image: phpmyadmin
 28          restart: always
 29          ports:
 30          # <Port exposed> : < MySQL Port running inside container>
 31                - '8080:80'
 32          depends_on:
 33                - db
 34          environment:
 35                    - PMA_HOST=db
 36
```
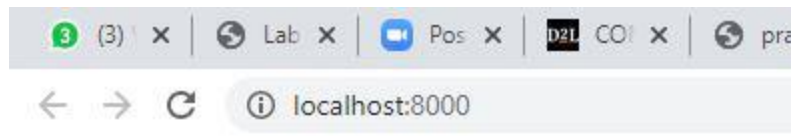
Task 3: Now that I have completed the docker-compose.yml file I will make a new folder called "ex3" and put the updated docker-compose.yml file, dockerfile, index and insert into the "ex3" folder. Then I went to CMD and ran the command - docker compose up on the folder ex3, as we can see in the image below.

```
:\Users\waleed\Desktop\PRACTICAL2_waleed_wazir_19396951\ex3>docker compose up
+] Running 0/13
 - db Pulling                                                                              2.3s
   - a2a00260331c Pulling fs layer                                                         0.1s
+] Running 0/31e Pulling fs layer                                                          0.1s
 - db Pulling                                                                              2.4s
   - a2a00260331c Pulling fs layer                                                         0.2s
+] Running 0/31e Pulling fs layer                                                          0.2s
 - db Pulling                                                                              2.5s
   - a2a00260331c Pulling fs layer                                                         0.3s
+] Running 0/31e Pulling fs layer                                                          0.3s
 - db Pulling                                                                              2.6s
   - a2a00260331c Pulling fs layer                                                         0.4s
+] Running 0/31e Pulling fs layer                                                          0.4s
 - db Pulling                                                                              2.7s
   - a2a00260331c Pulling fs layer                                                         0.5s
+] Running 0/31e Downloading [========================================>    ]     758B/...  0.5s
 - db Pulling                                                                              2.8s
   - a2a00260331c Downloading [>                               ] 507.2kB/...               0.6s
+] Running 0/31e Download complete                                                         0.6s
 - db Pulling                                                                              2.9s
   - a2a00260331c Downloading [=>                              ] 1.518MB/...               0.7s
+] Running 0/31e Download complete                                                         0.7s
 - db Pulling                                                                              3.0s
   - a2a00260331c Downloading [===>                            ] 3.038MB/...               0.8s
+] Running 0/31e Download complete                                                         0.8s
 - db Pulling                                                                              3.1s
   - a2a00260331c Downloading [====>                           ] 4.057MB/...               0.9s
+] Running 0/31e Download complete                                                         0.9s
 - db Pulling                                                                              3.2s
   - a2a00260331c Downloading [====>                           ] 4.057MB/...               1.0s
+] Running 31/31 Download complete                                                         1.0s
 - db Pulled
   - a2a00260331c Pull complete
   - 6d8167f2fcbe Pull complete
   - 32454e9854ca Pull complete
   - 473e2917b0d5 Pull complete
   - 5173f8104ec8 Pull complete
   - 32e218351f9a Pull complete
   - fc9e1a82359a Pull complete
   - c602a3ea2ce7 Pull complete
   - 3c9ea9927039 Pull complete
   - dfb1b236c7fc Pull complete
   - e2ad62bd72a7 Pull complete
 - phpmyadmin Pulled
   - bd159e379b3b Pull complete
   - 1e83b070fd97 Pull complete
   - e7793be89e9c Pull complete
   - 4220e0c03377 Pull complete
   - e32ee0a815d2 Pull complete
   - 89791c7bacac Pull complete
   - 263f74f407a4 Pull complete
   - 08b2c94789a9 Pull complete
   - 0728c36d431f Pull complete
   - 21933556955c Pull complete
   - 648e0d14815e Pull complete
   - 91f3176dfe6c Pull complete
   - a8c0834d9180 Pull complete
   - 6dcc9271849e Pull complete
   - baf1e1bf5fe3 Pull complete
```

Here we can see it is pulling and downloading the database and phpmyadmin. In the image below it finishes building and created the network ex3_default, container db, container php-apache and container ex3-phpmyadmin-1.

after running the command docker compose up, we see that a folder called php/src is created. I copy index and insert into the src folder that was created after we ran the command docker compose up. I then visited the website from this link http://localhost:8000/, As we can see in the image below.

Connected to MySQL server successfully!

Table users created successfully

ID: [   ]

Firstname: [   ]

password: [   ]

[Submit]

I then inputted multiple data into the table above and submitted it and from this we could see that we could not input duplicate ids when I tried inputting similar data.

1 record added

TABLE DATA: id name pass
19396951 Waleed wazir
193969513 Walee wazir3
Go back to insert more data
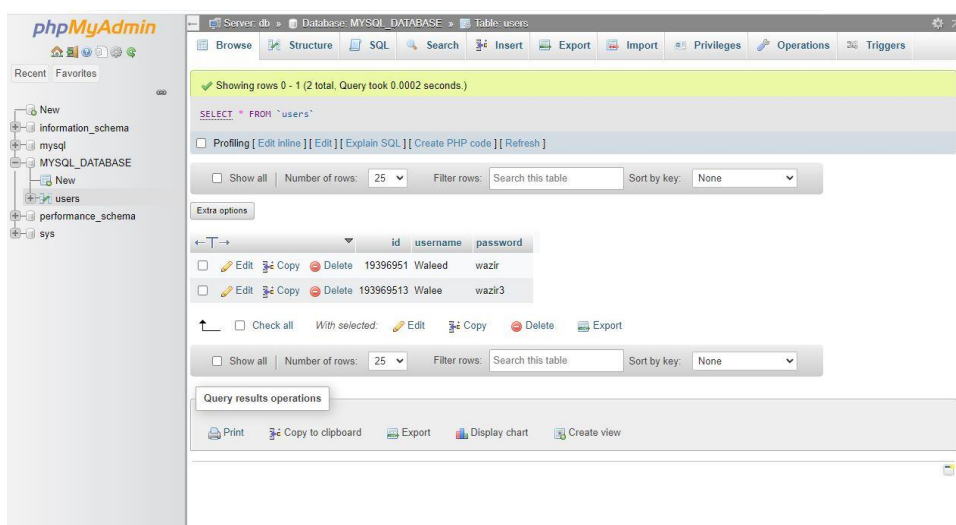
Error: Duplicate entry '19396951' for key 'PRIMARY'

After this I then visited The database using the admin port which was 8080 instead of 8000, http://localhost:8080 . Down below we can see the admin website.

I then logged into phpmyadmin using the login details provided in Task 3, the username is root and the password is MYSQL_ROOT_PASSWORD. When I logged in I arrived at the image below.

Here we can see the data we inputted into the MySql table. I was able to delete edit and add more if needed. I then