I.Build Todo Application

Build the app container image

Create a file named Dockerfile in the same folder as the file package.json with the following contents.

```
FROM node:12-alpine
RUN apk add --no-cache python2 g++ make
WORKDIR /app
COPY . .
RUN yarn install --production
CMD ["node","src/index.js"]
```

PS C:\Users\neeth\Downloads\getting-started-master> **cd app**

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker build -t getting-started .**

[+] Building 44.3s (10/10) FINISHED

 => [internal] load build definition from Dockerfile
0.0s

 => => transferring dockerfile: 32B
0.0s

 => [internal] load .dockerignore   0.0s

 => => transferring context: 2B   0.0s

 => [internal] load metadata for docker.io/library/node:12-alpine
0.0s

 => [1/5] FROM docker.io/library/node:12-alpine
0.0s

 => [internal] load build context   4.9s

 => => transferring context: 54.37MB
4.8s

 => CACHED [2/5] RUN apk add --no-cache python2 g++ make
0.0s

 => CACHED [3/5] WORKDIR /app
0.0s

 => [4/5] COPY . .   4.2s

 => [5/5] RUN yarn install --production
32.7s

 => exporting to image   2.3s

=> => exporting layers   2.3s

 => => writing image
sha256:533d712d9e1f926caa172bc48f13138391c5d130ba719a46840616a51625b673
0.0s

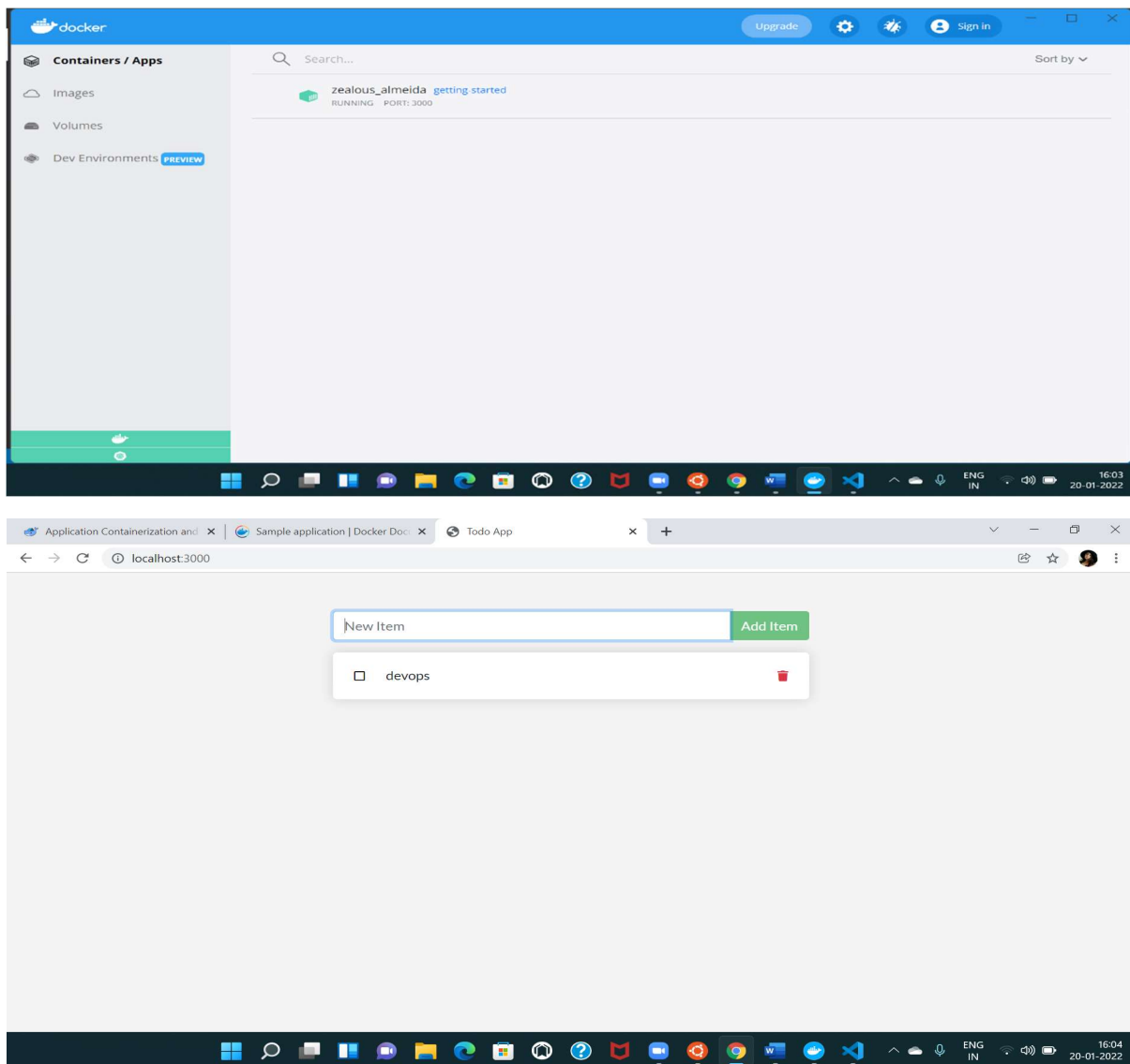 => => naming to docker.io/library/getting-started
0.0s

Use 'docker scan' to run Snyk tests against images to find vulnerabilities and learn how to fix them

Start an app container

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker run -dp 3000:3000 getting-started**

19d0ac98ba7549858021c69fb7b4a0aba069c898af563a5d2e616c79f46906e7
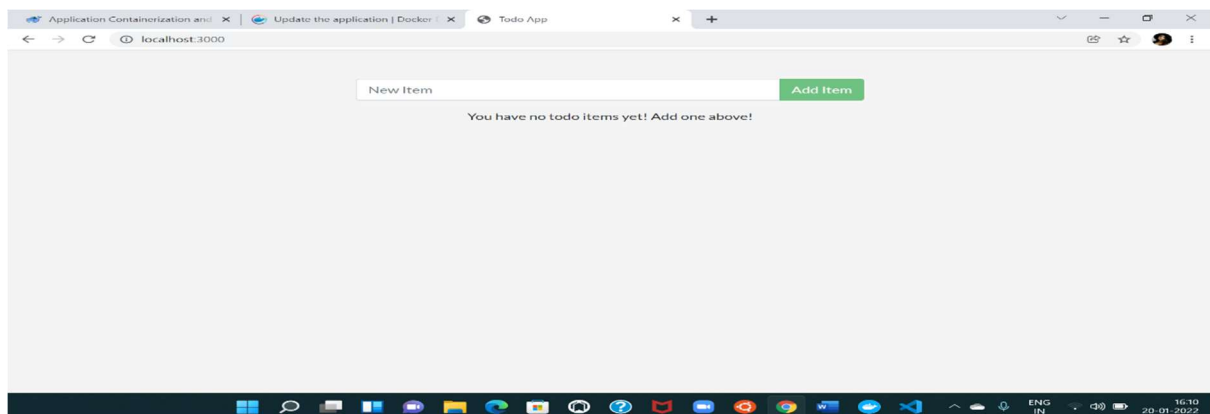
Update application

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker build -t getting-started .**

[+] Building 39.2s (10/10) FINISHED

Use 'docker scan' to run Snyk tests against images to find vulnerabilities and learn how to fix them

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker run -dp 3000:3000 getting-started**

0acb3a9ebff1608f49a25e419628c255f613cd3a52bc811063cdbe383506e560

Share the application

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker image build -t neethushanavas/getting-started .**

[+] Building 1.9s (10/10) FINISHED

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker run -dp 3000:3000 neethushanavas/getting-started**

f03a2a24fd2397b29f732b0d3b164caffcdc0e5e870e110b628859da744c4ea2

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker ps**

CONTAINER ID   IMAGE   COMMAND   CREATED   STATUS   PORTS

    NAMES

f03a2a24fd23   neethushanavas/getting-started   "docker-entrypoint.s…"   9 seconds ago   Up 7 seconds   0.0.0.0:3000->3000/tcp   inspiring_hamilton

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker push neethushanavas/getting-started**

Using default tag: latest

The push refers to repository [docker.io/neethushanavas/getting-started]

6d51912ca47f: Pushed

9db8f22faafc: Pushed

1a73fa416617: Pushed

6b09c4cc168c: Pushed

cc7d7abf9a7f: Mounted from library/node

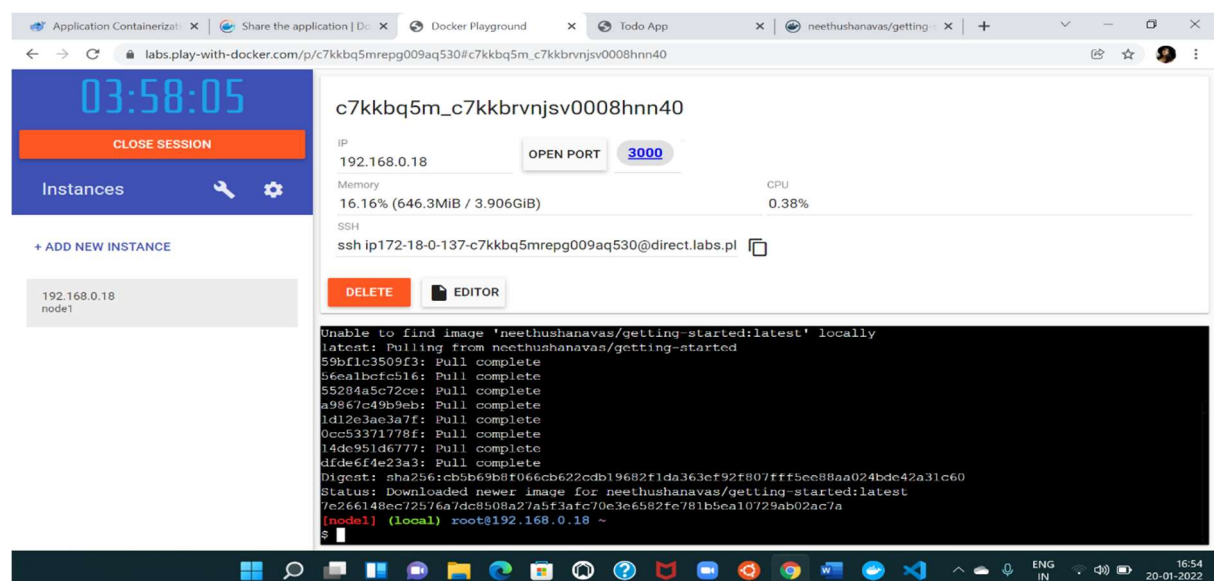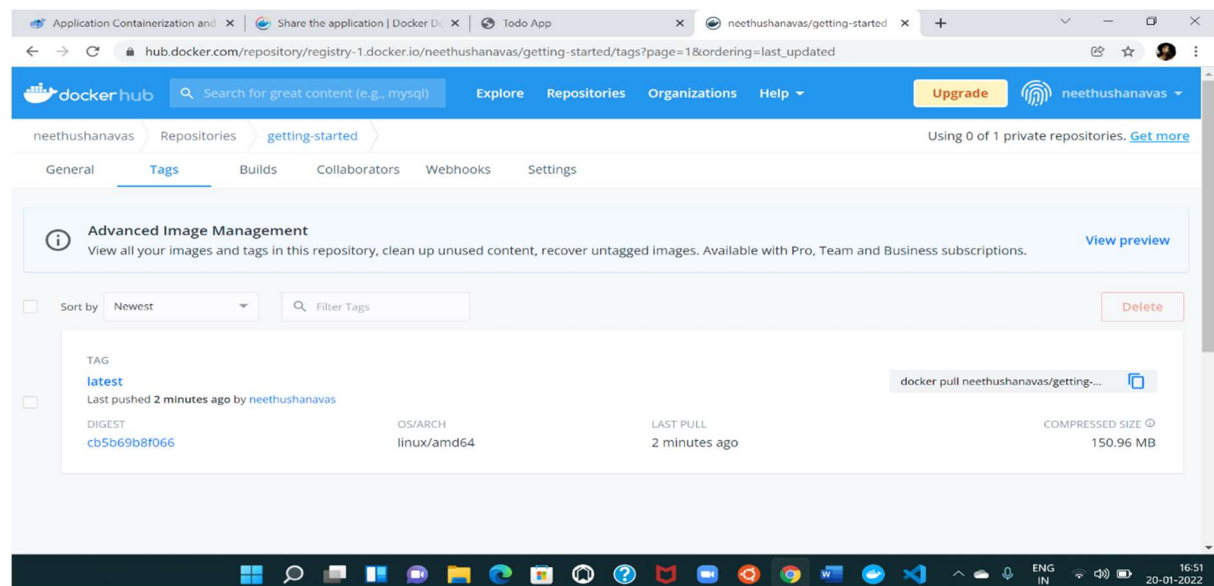4eb06231aba4: Mounted from library/node

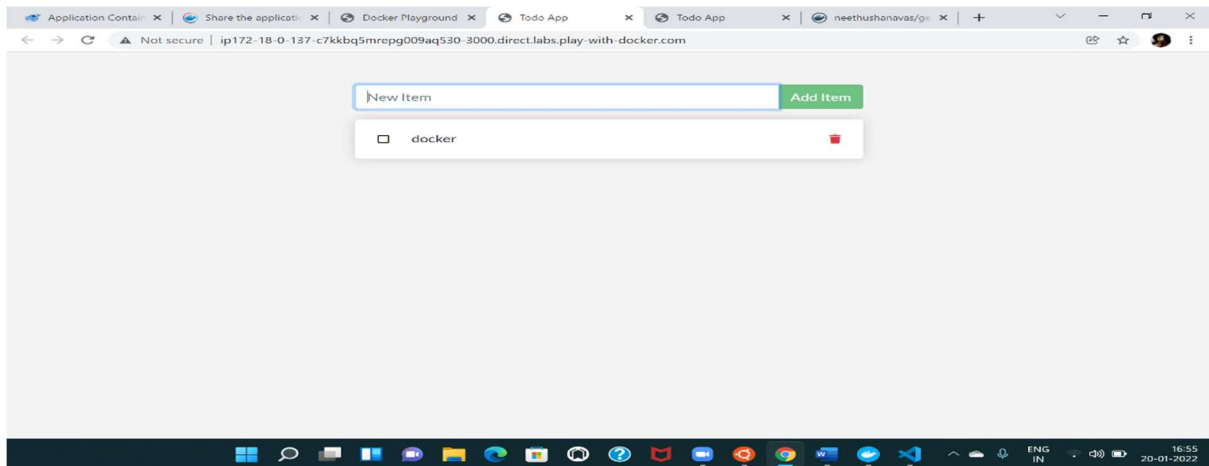62549ded9a31: Mounted from library/node

8d3ac3489996: Mounted from library/node

latest: digest: sha256:cb5b69b8f066cb622cdb19682f1da363ef92f807fff5ee88aa024bde42a31c60 size: 2001

start two containers and create a file in each

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker run -d ubuntu bash -c "shuf -i 1-10000 -n 1 -o /data.txt && tail -f /dev/null"**

Unable to find image 'ubuntu:latest' locally
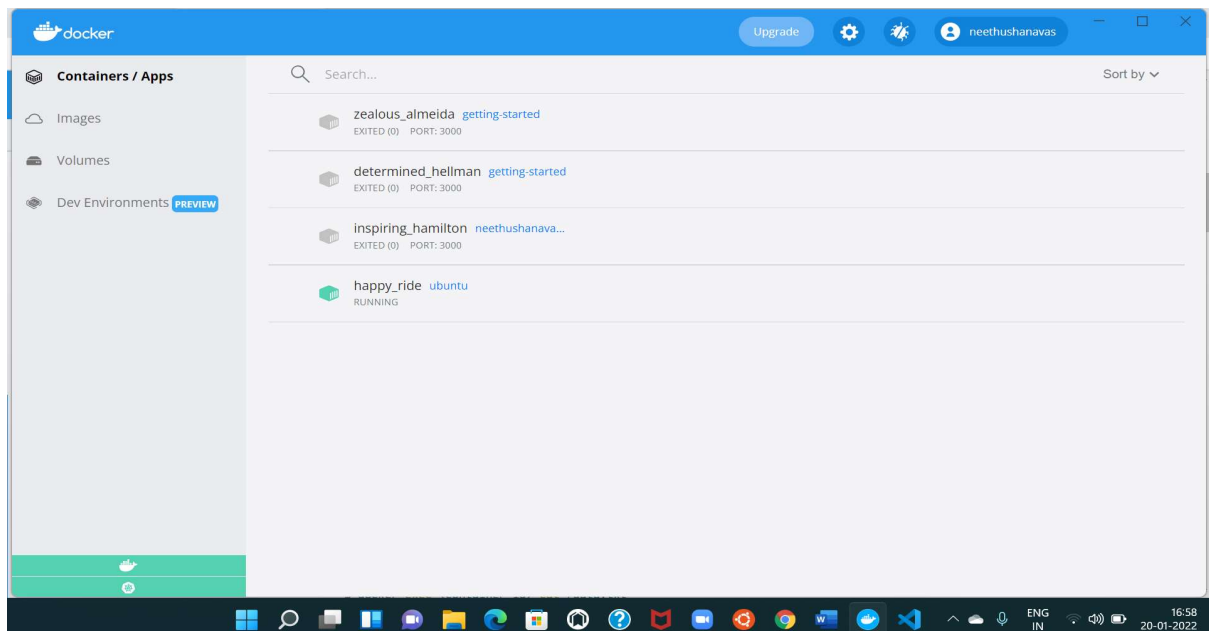
latest: Pulling from library/ubuntu

ea362f368469: Pull complete

Digest: sha256:b5a61709a9a44284d88fb12e5c48db0409cfad5b69d4ff8224077c57302df9cf

Status: Downloaded newer image for ubuntu:latest

3bb99f09e15ef85a1dd5c3338d19bca710a5d92abcd2a8ea8927b37457d487bf

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker ps**

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES

3bb99f09e15e   ubuntu   "bash -c 'shuf -i 1-..."   2 minutes ago   Up 2 minutes   happy_ride

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker exec 3bb99f09e15e cat /data.txt**

2885

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker run -it ubuntu ls**

bin dev home lib32 libx32 mnt proc run srv tmp var

boot etc lib lib64 media opt root sbin sys usr

Persist the todo data

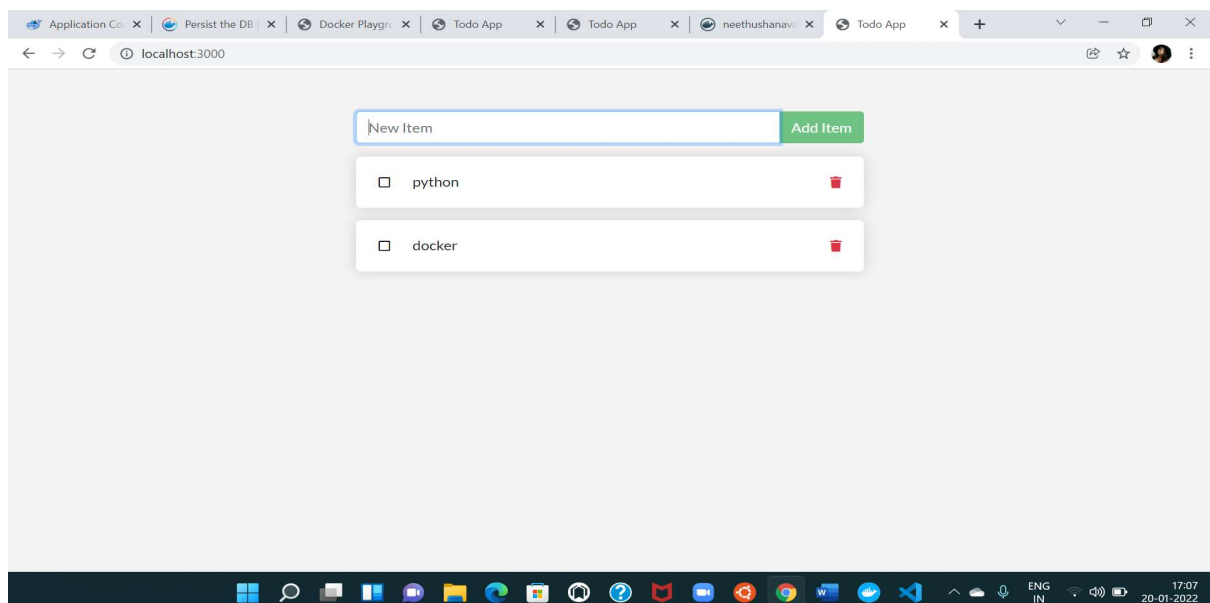PS C:\Users\neeth\Downloads\getting-started-master\app> **docker volume create todo-db**

todo-db

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker run -dp 3000:3000 -v todo-db:/etc/todos getting-started**

2425e0e72aab497dbfff1996e72c92f435c4f5c0122d13de77de896706232440

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker ps**

CONTAINER ID   IMAGE   COMMAND   CREATED   STATUS
PORTS   NAMES

2425e0e72aab   getting-started   "docker-entrypoint.s..."   2 minutes ago   Up 2 minutes   0.0.0.0:3000->3000/tcp   pedantic_elion

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker rm -f 2425e0e72aab**

2425e0e72aab

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker volume inspect todo-db**

```
[
    {
        "CreatedAt": "2022-01-20T11:37:47Z",
        "Driver": "local",
        "Labels": {},
        "Mountpoint": "/var/lib/docker/volumes/todo-db/_data",
        "Name": "todo-db",
        "Options": {},
        "Scope": "local"
    }
]
```

Using bind mount

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker run -dp 3000:3000 `**

>> -w /app -v "$(pwd):/app" `

>> node:12-alpine `

>> sh -c "yarn install && yarn run dev"

08620b5f57a5052382a9baa4f1d0a7362f95211667b9870eab99ecb952b6ed38

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker ps**

CONTAINER ID IMAGE   COMMAND   CREATED   STATUS
PORTS   NAMES

08620b5f57a5 node:12-alpine "docker-entrypoint.s..." 2 minutes ago Up 2 minutes   0.0.0.0:3000->3000/tcp   ecstatic_dirac

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker logs -f 08620b5f57a5**

yarn install v1.22.17

[1/4] Resolving packages...

warning Resolution field "ansi-regex@5.0.1" is incompatible with requested version "ansi-regex@^2.0.0"

warning Resolution field "ansi-regex@5.0.1" is incompatible with requested version "ansi-regex@^3.0.0"

success Already up-to-date.

Done in 1.33s.

yarn run v1.22.17

$ nodemon src/index.js

[nodemon] 2.0.13

[nodemon] to restart at any time, enter `rs`

[nodemon] watching path(s): *.*
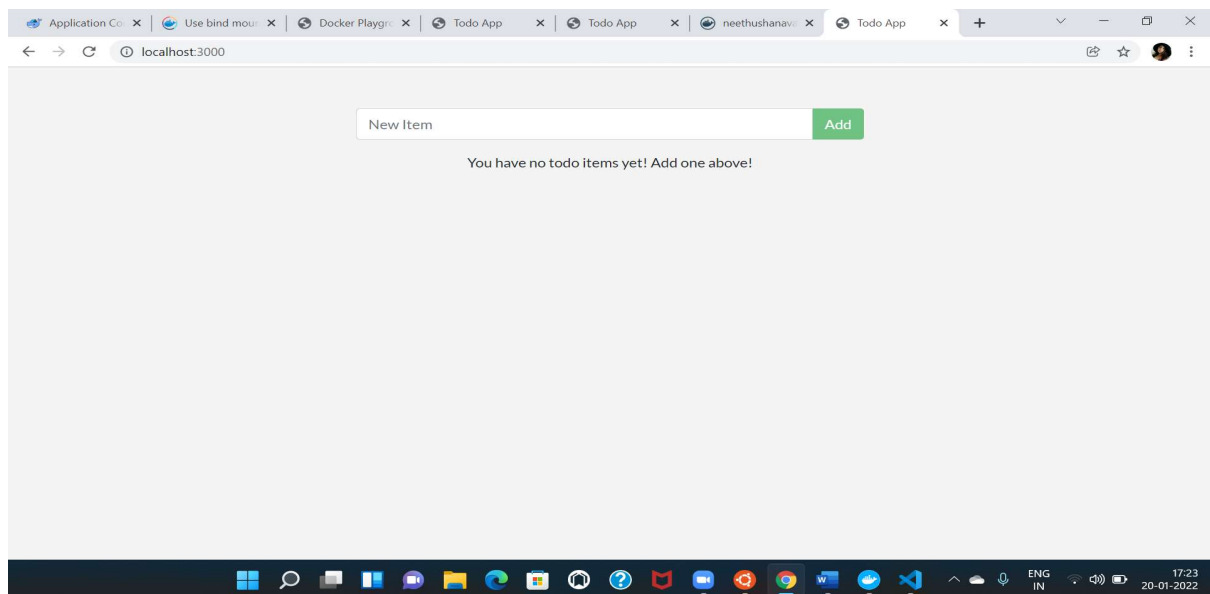
[nodemon] watching extensions: js,mjs,json

[nodemon] starting `node src/index.js`

Using sqlite database at /etc/todos/todo.db

Listening on port 3000

Changing line 109 in app.js in src

Multi container apps

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker network create todo-app**

Error response from daemon: network with name todo-app already exists

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker run -d `**

>> --network todo-app --network-alias mysql `

>> -v todo-mysql-data:/var/lib/mysql `

>> -e MYSQL_ROOT_PASSWORD=secret `

>> -e MYSQL_DATABASE=todos `

>> mysql:5.7

9a2863811350a4330d618cb672e3fc123e34a513ee968bb665a884a66b5891c6

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker ps**

CONTAINER ID IMAGE   COMMAND   CREATED   STATUS
PORTS   NAMES

9a2863811350 mysql:5.7   "docker-entrypoint.s..." 2 minutes ago   Up 2
minutes   3306/tcp, 33060/tcp   amazing_black

08620b5f57a5 node:12-alpine "docker-entrypoint.s..." 15 minutes ago   Up 15
minutes   0.0.0.0:3000->3000/tcp   ecstatic_dirac

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker exec -it
9a2863811350 mysql -u root -p**

Enter password:

Welcome to the MySQL monitor. Commands end with ; or \g.

Your MySQL connection id is 2

Server version: 5.7.36 MySQL Community Server (GPL)

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affiliates. Other names may be trademarks of their respective

owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> **SHOW DATABASES;**

+--------------------+

| Database |

+--------------------+

| information_schema |

| mysql |

| performance_schema |

```
| sys           |
| todos         |
+--------------------+
5 rows in set (0.01 sec)

mysql> exit
Bye
PS C:\Users\neeth\Downloads\getting-started-master\app> docker run -it --
network todo-app nicolaka/netshoot
        dP      dP              dP
        88      88              88
88d888b. .d8888b. d8888P .d8888b. 88d888b. .d8888b. .d8888b. d8888P
88'  `88 88ooood8   88   Y8ooooo. 88'  `88 88'  `88 88'  `88   88
88    88 88. ...    88         88 88    88 88. .88 88. .88   88
dP    dP `88888P'   dP   `88888P' dP    dP `88888P' `88888P'   dP


Welcome to Netshoot! (github.com/nicolaka/netshoot)
e32feabfe86b ⚡ ~ ⚡ dig mysql


; <<>> DiG 9.16.22 <<>> mysql
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 26889
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 0


;; QUESTION SECTION:
;mysql.                 IN    A


;; ANSWER SECTION:
mysql.           600   IN    A     172.18.0.2


;; Query time: 10 msec
```

;; SERVER: 127.0.0.11#53(127.0.0.11)

;; WHEN: Thu Jan 20 12:07:19 UTC 2022

;; MSG SIZE rcvd: 44

e32feabfe86b ↵ ~ ↵ exit

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker run -dp 3000:3000 `**

>> -w /app -v "$(pwd):/app" `

>> --network todo-app `

>> -e MYSQL_HOST=mysql `

>> -e MYSQL_USER=root `

>> -e MYSQL_PASSWORD=secret `

>> -e MYSQL_DB=todos `

>> node:12-alpine `

>> sh -c "yarn install && yarn run dev"

f9b2eb944ffbebcbf61d77ef7ceb779fd25e4106407f134fbafd960403bbf094

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker ps**

CONTAINER ID IMAGE   COMMAND   CREATED   STATUS
PORTS   NAMES

f9b2eb944ffb node:12-alpine "docker-entrypoint.s..." About a minute ago   Up
About a minute   0.0.0.0:3000->3000/tcp   brave_rubin

9a2863811350 mysql:5.7   "docker-entrypoint.s..." 10 minutes ago   Up 10
minutes   3306/tcp, 33060/tcp   amazing_black

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker logs f9b2eb944ffb**

yarn install v1.22.17

[1/4] Resolving packages...

warning Resolution field "ansi-regex@5.0.1" is incompatible with requested version
"ansi-regex@^2.0.0"

warning Resolution field "ansi-regex@5.0.1" is incompatible with requested version
"ansi-regex@^3.0.0"

success Already up-to-date.

Done in 0.92s.

yarn run v1.22.17

$ nodemon src/index.js

[nodemon] 2.0.13

[nodemon] to restart at any time, enter `rs`

[nodemon] watching path(s): *.*

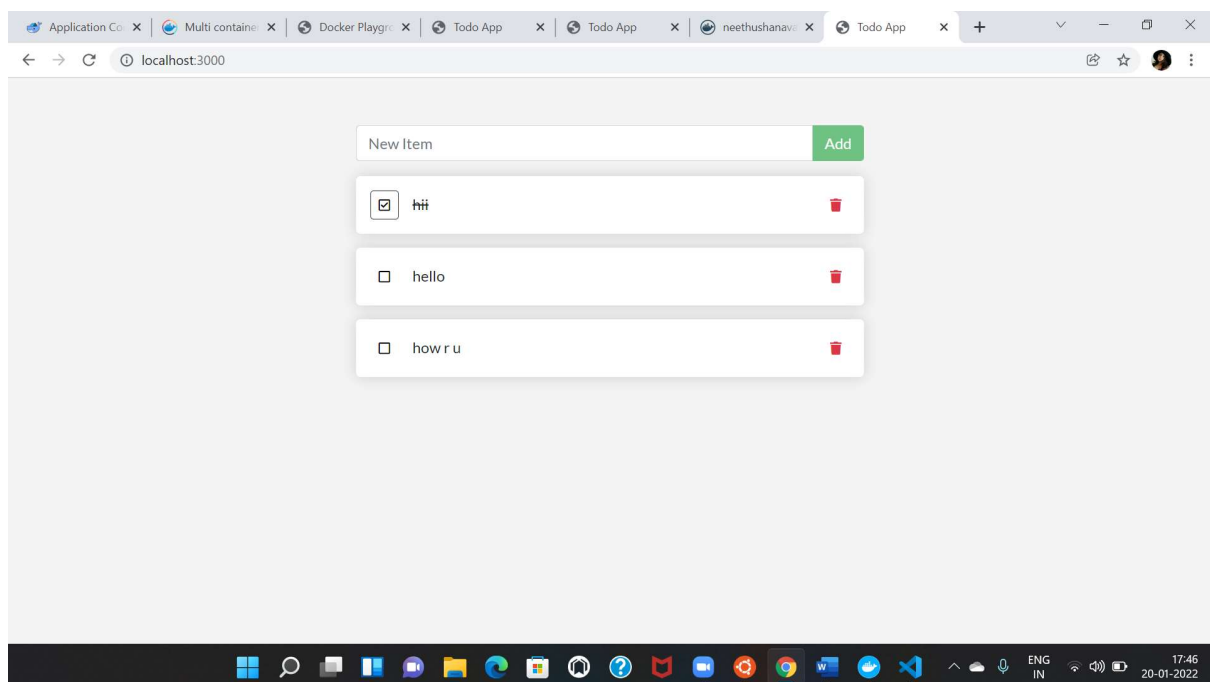[nodemon] watching extensions: js,mjs,json

[nodemon] starting `node src/index.js`

Waiting for mysql:3306.

Connected!

Connected to mysql db at host mysql

Listening on port 3000

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker exec -it 9a2863811350 mysql -p todos**

Enter password:

Reading table information for completion of table and column names

You can turn off this feature to get a quicker startup with -A

Welcome to the MySQL monitor. Commands end with ; or \g.

Your MySQL connection id is 5

Server version: 5.7.36 MySQL Community Server (GPL)

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Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
mysql> **select * from todo_items;**

```
+------------------------------------+--------+-----------+
| id                                 | name   | completed |
+------------------------------------+--------+-----------+
| 1b047d80-e67a-4151-a4f1-4baf10a6b1a9 | hii    |         1 |
| c01323ef-e59f-42ab-89c9-4c5931cc9a35 | hello  |         0 |
| 7321597e-ed29-48e7-89a3-0f473322b60e | how r u |        0 |
+------------------------------------+--------+-----------+
```
3 rows in set (0.00 sec)
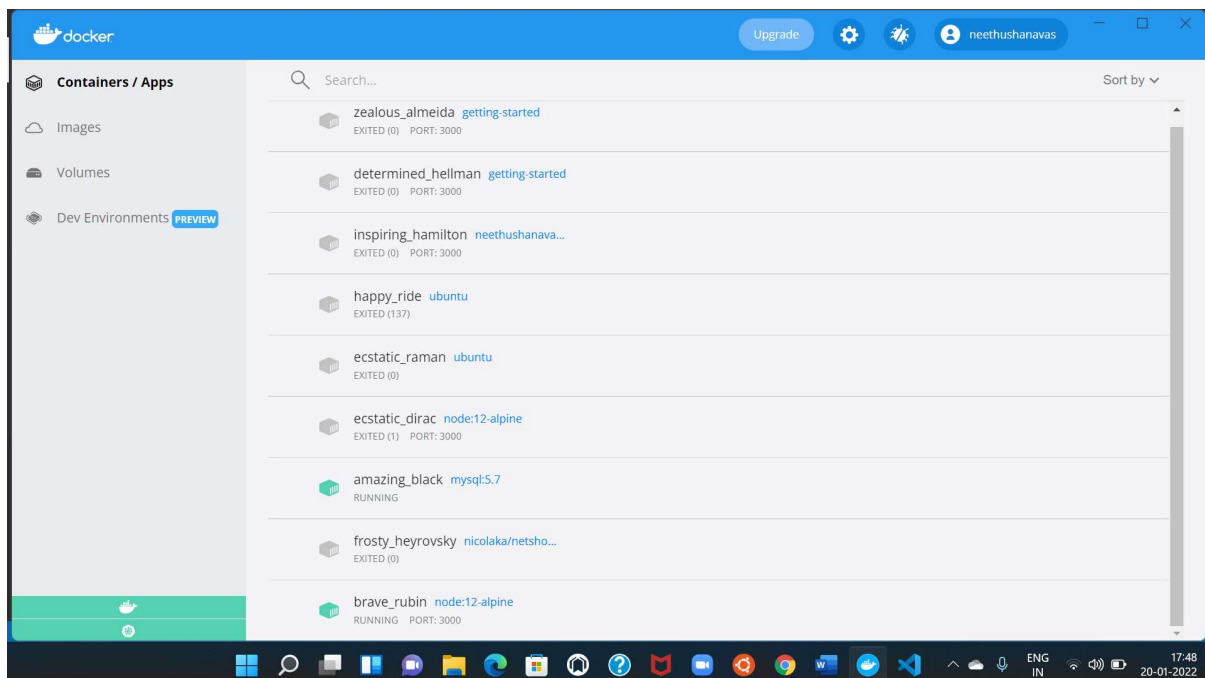
Use Docker compose

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker-compose up -d**
Creating network "app_default" with the default driver

Creating app_mysql_1 ... done

Creating app_app_1 ... done

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker-compose logs -f**
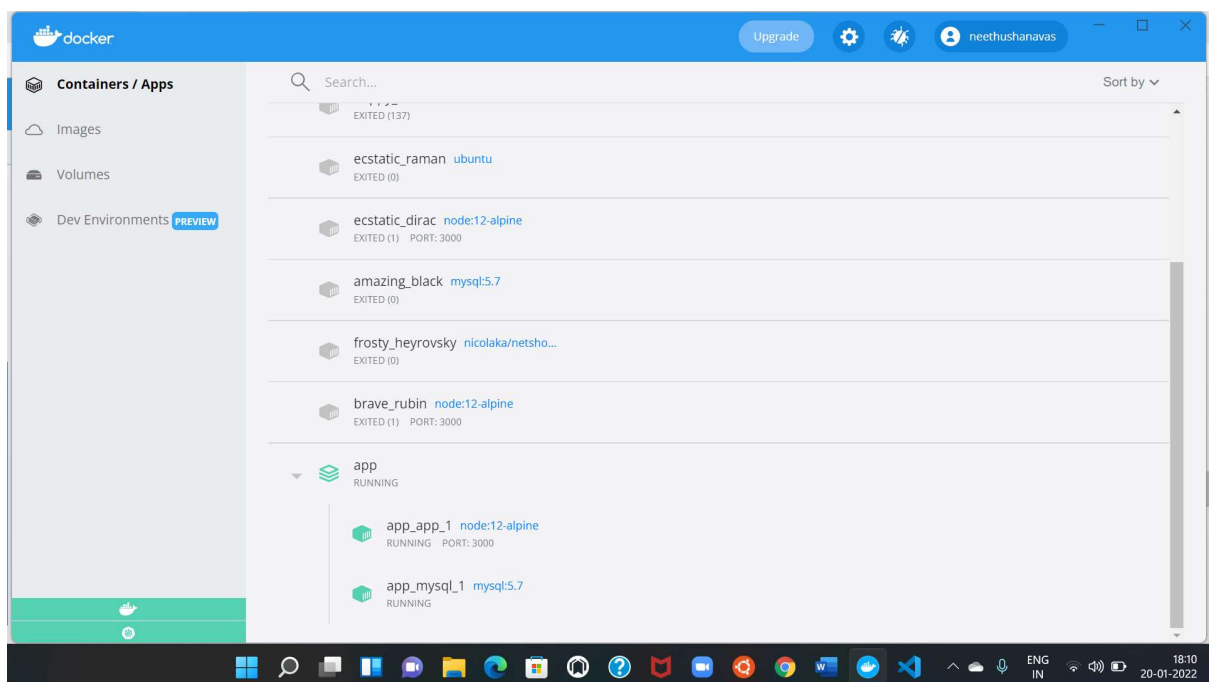
Attaching to app_mysql_1, app_app_1

app_1 | Waiting for mysql:3306.

app_1 | Connected!

app_1 | Connected to mysql db at host mysql

app_1 | Listening on port 3000

PS C:\Users\neeth\Downloads\getting-started-master\app> **docker-compose down**

Removing app_mysql_1 ... done

Removing app_app_1 ... done

Removing network app_default

docker-compose.yml

```
version: "3.7"

services:
  app:
    image: node:12-alpine
    command: sh -c "yarn install && yarn run dev"
    ports:
      - 3000:3000
```

```yaml
    working_dir: /app
    volumes:
      - ./:/app
    environment:
      MYSQL_HOST: mysql
      MYSQL_USER: root
      MYSQL_PASSWORD: secret
      MYSQL_DB: todos

  mysql:
    image: mysql:5.7
    volumes:
      - todo-mysql-data:/var/lib/mysql
    environment:
      MYSQL_ROOT_PASSWORD: secret
      MYSQL_DATABASE: todos

volumes:
  todo-mysql-data:
```