Docker Compose week 6

1.Define and run multiple interdependent services

Word Press:

```
version: '3.8'  # Docker Compose file format version

services:
  wordpress:  # WordPress service
    image: wordpress:latest
    ports:
      - "8236:80"  # Map port 80 of the container to port 8080 of the host
    environment:
      WORDPRESS_DB_HOST: db:3306  # Database host
      WORDPRESS_DB_USER: wordpress
      WORDPRESS_DB_PASSWORD: wordpress
      WORDPRESS_DB_NAME: wordpress
    depends_on:
      - db  # Ensures the db service starts first

  db:  # MySQL service
    image: mysql:5.7
    environment:
      MYSQL_ROOT_PASSWORD: rootpassword
      MYSQL_DATABASE: wordpress
      MYSQL_USER: wordpress
      MYSQL_PASSWORD: wordpress
```

1. **To Start the compose**

```
azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/Dockercompos
e (main)
$ docker compose -f compose.yaml up -d
time="2025-08-27T09:56:58+05:30" level=warning msg="C:\\Users\\azeem\\OneDrive\\Desktop\\Dockercomp
ose\\compose.yaml: the attribute `version` is obsolete, it will be ignored, please remove it to avo
id potential confusion"
time="2025-08-27T09:56:58+05:30" level=warning msg="Found orphan containers ([dockercompose-wordpre
ss-1]) for this project. If you removed or renamed this service in your compose file, you can run t
his command with the --remove-orphans flag to clean it up."
[+] Running 2/2
 ✔ Container dockercompose-web-1  Started                                    0.7s
 ✔ Container dockercompose-db-1   Started                                    0.5s
```

2.To stop the containers

```
azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/Dockercompose (main)
$ docker compose down
time="2025-08-27T09:58:52+05:30" level=warning msg="C:\\Users\\azeem\\OneDrive\\Desktop\\Dockercomp
ose\\compose.yaml: the attribute `version` is obsolete, it will be ignored, please remove it to avo
id potential confusion"
[+] Running 3/3
 ✔ Container dockercompose-web-1  Removed                                    0.5s
 ✔ Container dockercompose-db-1   Removed                                    0.4s
 ✔ Network dockercompose_default  Removed                                    0.3s
```

3.To scale the container

```
azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/Dockercompose (main)
$ docker-compose up --scale db=2 -d
time="2025-08-27T09:59:57+05:30" level=warning msg="C:\\Users\\azeem\\OneDrive\\Desktop\\Dockercomp
ose\\compose.yaml: the attribute `version` is obsolete, it will be ignored, please remove it to avo
id potential confusion"
time="2025-08-27T09:59:57+05:30" level=warning msg="Found orphan containers ([dockercompose-wordpre
ss-1]) for this project. If you removed or renamed this service in your compose file, you can run t
his command with the --remove-orphans flag to clean it up."
[+] Running 4/4
 ✔ Network dockercompose_default  Created                                    0.0s
 ✔ Container dockercompose-db-2   Started                                    1.1s
 ✔ Container dockercompose-web-1  Started                                    0.8s
 ✔ Container dockercompose-db-1   Started                                    0.8s
```

To check the network

```
azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/Dockercompose (main)
$ docker network ls
NETWORK ID     NAME                       DRIVER    SCOPE
de0b7aef9ab2   bridge                     bridge    local
939e68639102   dockercompose_default      bridge    local
7887a166bcb2   host                       host      local
a0eb77da1f1e   none                       null      local
```

create a file docker-compose.yml

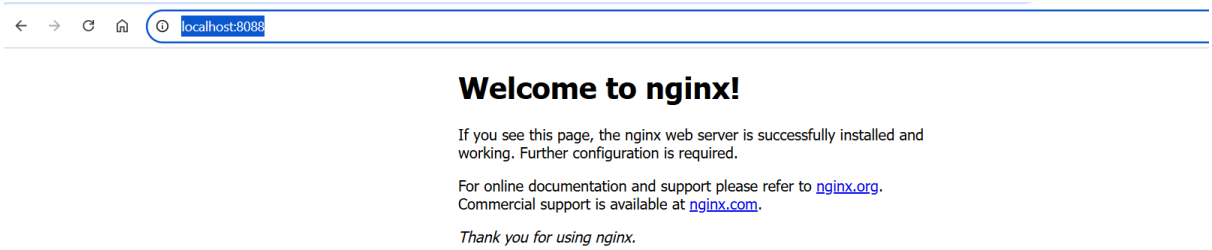
compose.yaml

```yaml
version: "3.9"
services:
  web:
    image: nginx:latest
    ports:
      - "8088:80"

  db:
    image: postgres:15
    environment:
      POSTGRES_USER: demo
      POSTGRES_PASSWORD: demo
      POSTGRES_DB: demo_db

```

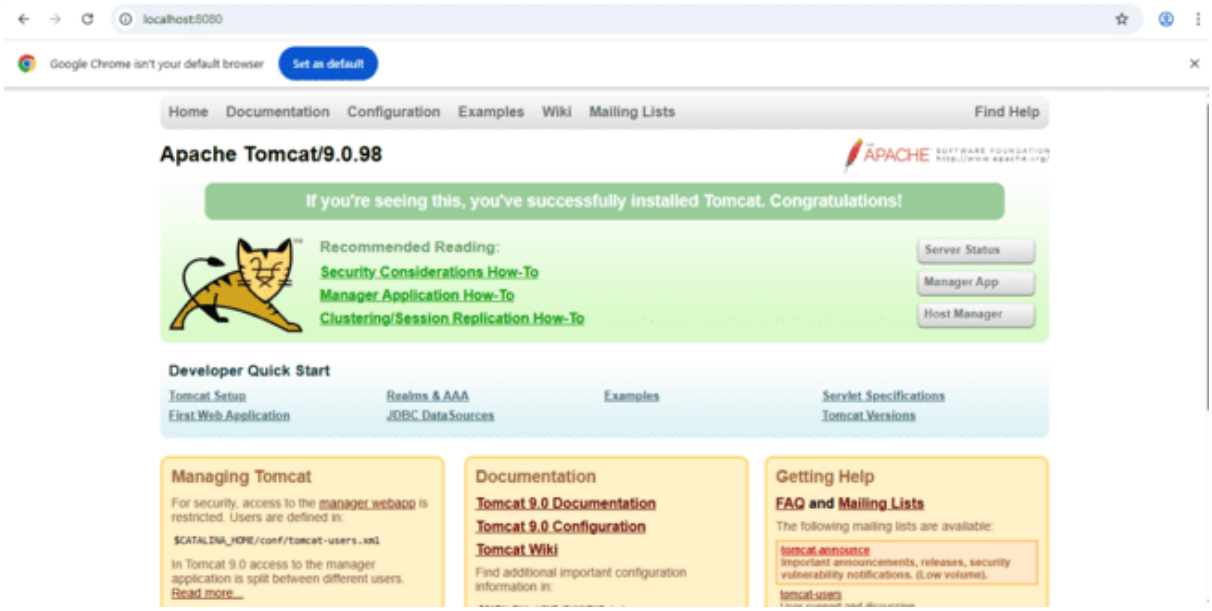
Run the setup

```
azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/Dockercompose (main)
$ docker compose -f compose.yaml up -d
time="2025-08-26T18:04:33+05:30" level=warning msg="C:\\Users\\azeem\\OneDrive\\Desktop\\Dockercompose\\compose.yaml: the attribute `version` is obsolete, it will be ignored, please remove it to avoid potential confusion"
time="2025-08-26T18:04:33+05:30" level=warning msg="Found orphan containers ([dockercompose-wordpress-1]) for this project. If you removed or renamed this service in your compose file, you can run this command with the --remove-orphans flag to clean it up."
[+] Running 2/2
 ✔ Container dockercompose-db-1   Running                                    0.0s
 ✔ Container dockercompose-web-1  Started                                    1.5s
```

Open your browser and visit: http://localhost:8088



Changed the default port because the Tomcat server is already running on the default port 8080



To stop the containers

```
azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/Dockercompose (main)
$ docker-compose down
time="2025-08-27T09:37:11+05:30" level=warning msg="C:\\Users\\azeem\\OneDrive\\Desktop\\D
ockercompose\\compose.yaml: the attribute `version` is obsolete, it will be ignored, pleas
e remove it to avoid potential confusion"
[+] Running 3/2
 ✔ Container dockercompose-db-1   Removed                                    0.8s
 ✔ Container dockercompose-web-1  Removed                                    0.8s
 ! Network dockercompose_default  Resource is sti...                         0.0s
```

2.Write and interpret docker-compose.yml files

I. Modify docker-compose.yml to add a Redis cache:

compose.yaml

```yaml
version: "3.9"
services:
  web:
    image: nginx:latest
    ports:
      - "8088:80"

  db:
    image: postgres:15
    environment:
      POSTGRES_USER: demo
      POSTGRES_PASSWORD: demo
      POSTGRES_DB: demo_db

```

Restart the setup:

```
azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/Dockercompose (main)
$ docker compose -f compose.yaml up -d
time="2025-08-27T09:39:29+05:30" level=warning msg="C:\\Users\\azeem\\OneDrive\\Desktop\\Dockercompose\\compose.yaml: the attribute `version` is obsolete, it will be ignored, please remove it to avoid potential confusion"
time="2025-08-27T09:39:29+05:30" level=warning msg="Found orphan containers ([dockercompose-wordpress-1]) for this project. If you removed or renamed this service in your compose file, you can run this command with the --remove-orphans flag to clean it up."
[+] Running 2/2
 ✔ Container dockercompose-web-1  Started                                    1.0s
 ✔ Container dockercompose-db-1   Started                                    1.0s
```

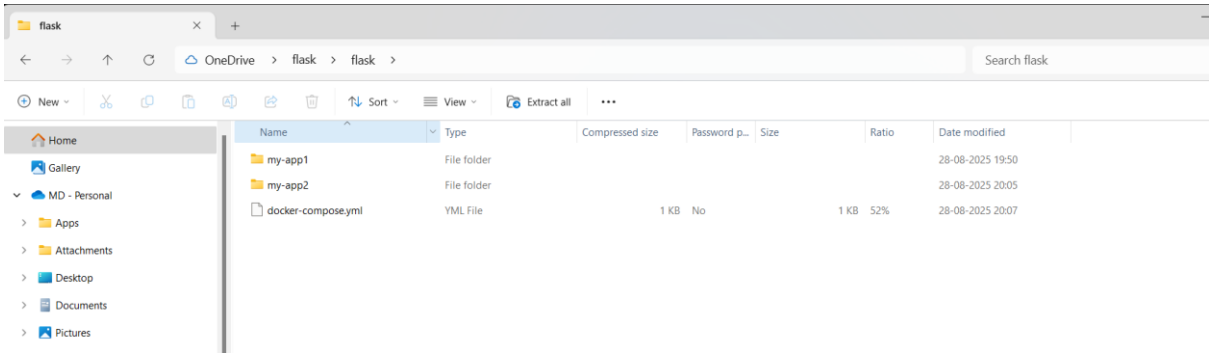
Docker compose ps

```
azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/Dockercompose (main)
$ docker compose ps
time="2025-08-27T09:40:05+05:30" level=warning msg="C:\\Users\\azeem\\OneDrive\\Desktop\\Dockercompose\\compose.yaml: the attribute `version` is obsolete, it will be ignored, please remove it to avoid potential confusion"
NAME                        IMAGE              COMMAND                  SERVICE     CREATED          STATUS          PORTS
dockercompose-db-1          postgres:15        "docker-entrypoint.s…"   db          37 seconds ago   Up 36 seconds   5432/tcp
dockercompose-web-1         nginx:latest       "/docker-entrypoint.…"   web         37 seconds ago   Up 36 seconds   0.0.0.0:8088->80/tcp
dockercompose-wordpress-1   wordpress:latest   "docker-entrypoint.s…"   wordpress   16 hours ago     Up 16 hours     0.0.0.0:8086->80/tcp
```

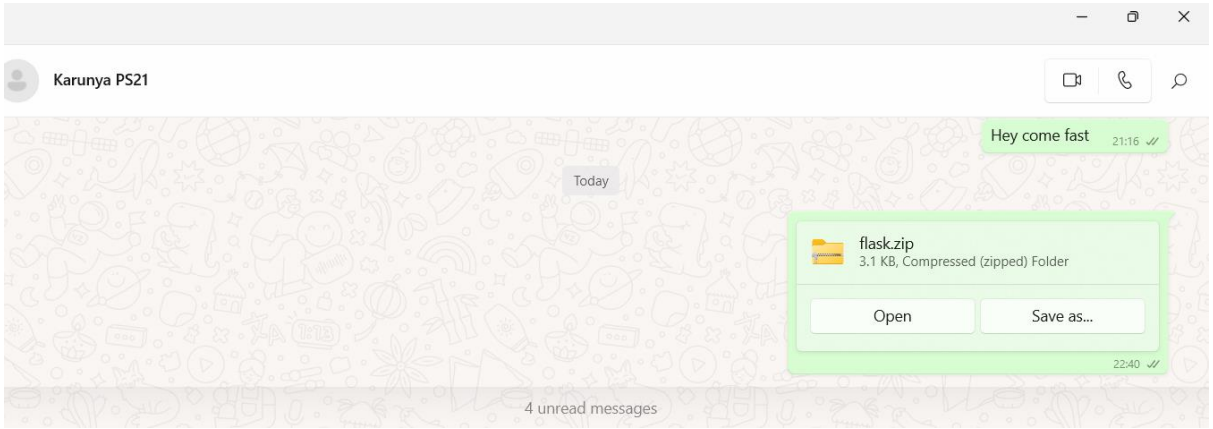
Three services (web, db, redis) are listed as running.

Task: 3 Deploy across different machines

Zip your compose-lab folder.



Shared the zip file to my friend



II. Run:

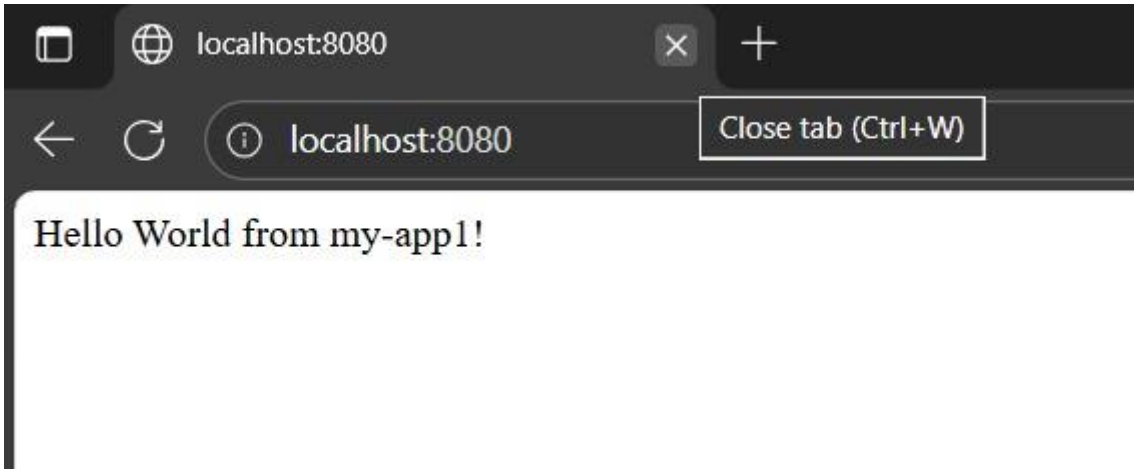
docker compose up -d

```
baman@karunya MINGW64 ~/OneDrive/Documents/flask[1]/flask (main)
$ ls
docker-compose.yml  my-app1/  my-app2/

baman@karunya MINGW64 ~/OneDrive/Documents/flask[1]/flask (main)
$ docker --version
Docker version 28.3.2, build 578ccf6

baman@karunya MINGW64 ~/OneDrive/Documents/flask[1]/flask (main)

[+] Running 9/9
 ✔ db Pulled
   ✔ a0ef231c0fc5 Pull complete
   ✔ a3be5d4ce401 Pull complete
   ✔ d403fe017dea Pull complete
   ✔ 81a4f01c8a98 Pull complete
   ✔ 6dc486ace974 Pull complete
   ✔ b0e3ae2a5b88 Pull complete
   ✔ d691d168572b Pull complete
   ✔ e27d17405276 Pull complete
#1 [internal] load local bake definitions
#1 reading from stdin 1.08kB done
#1 DONE 0.0s

#2 [backend internal] load build definition from Dockerfile
#2 transferring dockerfile: 320B 0.0s done
#2 DONE 0.1s

#3 [frontend internal] load build definition from Dockerfile
#3 transferring dockerfile: 320B 0.0s done
#3 DONE 0.1s

#4 [frontend internal] load metadata for docker.io/library/node:18
#4 DONE 5.4s

#5 [frontend internal] load .dockerignore
#5 transferring context: 2B done
#5 DONE 0.1s

#6 [backend internal] load .dockerignore
#6 transferring context: 2B done
#6 DONE 0.1s

#7 [backend internal] load build context
#7 transferring context: 818B done
#7 DONE 0.1s

#8 [frontend internal] load build context
#8 transferring context: 858B done
#8 DONE 0.1s

#9 [frontend 1/5] FROM docker.io/library/node:18@sha256:c6ae79e38498325db67193d391e6ec1d224d96c693a8a4d943498556716d3783
#9 resolve docker.io/library/node:18@sha256:c6ae79e38498325db67193d391e6ec1d224d96c693a8a4d943498556716d3783 0.0s done
#9 sha256:3697be50c98b9d071df4637e1d3491d00e7b9f3a732768c876d82309b3c5a145 0B / 1.25MB 0.2s
#9 sha256:e23f099911d692f62b851cf49a1e93294288a115f5cd2d014180e4d3684d34ab 0B / 211.36MB 0.2s
#9 sha256:cda7f44f2bddcc4bb7514474024b3f3705de00ddb6355a33be5ac7808e5b7125 0B / 3.32kB 0.2s
#9 sha256:461077a72fb7fe40d34a37d6a1958c4d16772d0dd77f572ec50a1fdc41a3754d 0B / 446B 0.2s
```

```
#9 extracting sha256:79b2f47ad4443652b9b5cc81a95ede249fd976310efdbee159f29638783778c0
#9 extracting sha256:37927ed901b1b2608b72796c6881bf645480268eca4ac9a37b9219e050bb4d84 0.8s done
#9 extracting sha256:79b2f47ad4443652b9b5cc81a95ede249fd976310efdbee159f29638783778c0 1.8s done
#9 extracting sha256:79b2f47ad4443652b9b5cc81a95ede249fd976310efdbee159f29638783778c0 1.8s done
#9 extracting sha256:e23f099911d692f62b851cf49a1e93294288a115f5cd2d014180e4d3684d34ab
#9 extracting sha256:e23f099911d692f62b851cf49a1e93294288a115f5cd2d014180e4d3684d34ab 5.1s done
#9 extracting sha256:e23f099911d692f62b851cf49a1e93294288a115f5cd2d014180e4d3684d34ab 5.1s done
#9 extracting sha256:cda7f44f2bddcc4bb7514474024b3f3705de00ddb6355a33be5ac7808e5b7125 0.0s done
#9 extracting sha256:c6b30c3f16966552af10ac00521f60355b1fcfd46ac1c20b1038587e28583ce7
#9 extracting sha256:c6b30c3f16966552af10ac00521f60355b1fcfd46ac1c20b1038587e28583ce7 1.5s done
#9 extracting sha256:c6b30c3f16966552af10ac00521f60355b1fcfd46ac1c20b1038587e28583ce7 1.5s done
#9 extracting sha256:3697be50c98b9d071df4637e1d3491d00e7b9f3a732768c876d82309b3c5a145 0.1s done
#9 extracting sha256:461077a72fb7fe40d34a37d6a1958c4d16772d0dd77f572ec50a1fdc41a3754d 0.0s done
#9 DONE 29.8s

#10 [backend 2/5] WORKDIR /usr/src/app
#10 DONE 1.9s

#11 [backend 3/5] COPY package*.json ./
#11 DONE 0.1s

#12 [frontend 3/5] COPY package*.json ./
#12 DONE 0.2s

#13 [frontend 4/5] RUN npm install
#13 4.985
#13 4.985 added 69 packages, and audited 70 packages in 4s
#13 4.985
#13 4.985 14 packages are looking for funding
#13 4.985   run `npm fund` for details
#13 4.986
#13 4.986 found 0 vulnerabilities
#13 4.988 npm notice
#13 4.988 npm notice New major version of npm available! 10.8.2 -> 11.5.2
#13 4.988 npm notice Changelog: https://github.com/npm/cli/releases/tag/v11.5.2
#13 4.988 npm notice To update run: npm install -g npm@11.5.2
#13 4.988 npm notice
#13 ...

#14 [backend 4/5] RUN npm install
#14 5.010
#14 5.010 added 69 packages, and audited 70 packages in 4s
#14 5.010
#14 5.010 14 packages are looking for funding
#14 5.010   run `npm fund` for details
#14 5.011
#14 5.011 found 0 vulnerabilities
#14 5.013 npm notice
#14 5.013 npm notice New major version of npm available! 10.8.2 -> 11.5.2
#14 5.013 npm notice Changelog: https://github.com/npm/cli/releases/tag/v11.5.2
#14 5.013 npm notice To update run: npm install -g npm@11.5.2
#14 5.013 npm notice
#14 DONE 5.6s

#13 [frontend 4/5] RUN npm install
#13 DONE 5.6s
```

```
#15 DONE 0.2s

#17 [frontend] exporting to image
#17 exporting layers
#17 exporting layers 0.9s done
#17 exporting manifest sha256:3a1c5ff44fbbb50e7f7749faa8e235b7397f01681b91ae3b14791c0a2b15f038 0.1s done
#17 exporting config sha256:8ee37251ca334b50f8b5395ce6fd88e13c5eb2c5588d9207f67ecd0d44d5b230 0.1s done
#17 exporting attestation manifest sha256:f8117caf2a25c1b76e2d75ada8dec3aa53bf7b1c7b11ca8edd16c27c7924690f
#17 exporting attestation manifest sha256:f8117caf2a25c1b76e2d75ada8dec3aa53bf7b1c7b11ca8edd16c27c7924690f 0.1s done
#17 exporting manifest list sha256:ee8669247c511823dbc5ff0a566e5131ebf1bbec0c724dc89d52e82a729ca335 0.0s done
#17 naming to docker.io/library/flask-frontend:latest done
#17 unpacking to docker.io/library/flask-frontend:latest
#17 unpacking to docker.io/library/flask-frontend:latest 0.6s done
#17 DONE 1.9s

#18 [backend] exporting to image
#18 exporting layers 0.9s done
#18 exporting manifest sha256:78ae900dbd16b695862d9f47415002c17435fb702fdfa3444fbfc6de40a569c2 0.0s done
#18 exporting config sha256:1062d56d35ebdb849bff3a72d542d57e7c80a41e3d6642eb496b3b14bcd49bfe 0.1s done
#18 exporting attestation manifest sha256:29ff05369126cad7917252bbb1f43daf6ebc123d976700eee278123ab994d38b 0.1s done
#18 exporting manifest list sha256:c47bfc0420dbc3ce0471052726951ab906399fddafce9c729c7740c91eb59d76 0.0s done
#18 naming to docker.io/library/flask-backend:latest 0.0s done
#18 unpacking to docker.io/library/flask-backend:latest 0.6s done
#18 DONE 1.9s

#19 [backend] resolving provenance for metadata file
#19 DONE 0.1s

#20 [frontend] resolving provenance for metadata file
#20 DONE 0.0s
[+] Running 7/7
 ✔ flask-frontend              Built
 ✔ flask-backend               Built
 ✔ Network flask_default       Created
 ✔ Volume "flask_mongo-data"   Created
 ✔ Container flask-backend-1   Started
 ✔ Container my-mongo          Started
 ✔ Container flask-frontend-1  Started

baman@karunya MINGW64 ~/OneDrive/Documents/flask[1]/flask (main)
$
```

The same services run on the new machine without changes.



Task:4 Networking and persistent storage

I. **Update your docker-compose.yml to add a custom network and volume:**

```yaml
mpose.yaml
services:
  web:
    image: nginx:latest
    ports:
      - "8088:80"
    networks:
      - app-net
    depends_on:
      - db

  db:
    image: postgres:15
    environment:
      POSTGRES_USER: demo
      POSTGRES_PASSWORD: demo
      POSTGRES_DB: demo_db
    volumes:
      - db-data:/var/lib/postgresql/data
    networks:
      - app-net

networks:
  app-net:

volumes:
  db-data:
```

2. Run:

```
azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/Dockercompose (main)
$ docker compose -f compose.yaml up -d
[+] Running 2/2
 ✔ Network dockercompose_app-net   Created                                    0.
 ✔ Volume "dockercompose_db-data"  Created                                    0.
[+] Running 5/57T10:05:06+05:30" level=warning msg="Found orphan containers ([dockercompose-word
 ✔ Network dockercompose_app-net   Created                                    0.
 ✔ Volume "dockercompose_db-data"  Created                                    0.
 ✔ Container dockercompose-web-1   Started                                    2.
 ✔ Container dockercompose-db-2    Removed                                    0.
 ✔ Container dockercompose-db-1    Started                                    1.
```

3.Remove containers:

```
azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/Dockercompose (main)
$ docker compose -f compose.yaml down
[+] Running 3/3
 ✔ Container dockercompose-web-1  Removed
 ✔ Container dockercompose-db-1   Removed
 ✔ Network dockercompose_app-net  Removed
```

4. Start again:

```
azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/Dockercompose (main)
$ docker compose -f compose.yaml up -d
[+] Running 1/0
 ✔ Network dockercompose_app-net  Created                                    0.0s
time="2025-08-27T10:06:32+05:30" level=warning msg="Found orphan containers ([dockercompose-wordpre
[+] Running 3/3 project. If you removed or renamed this service in your compose file, you can run t
 ✔ Network dockercompose_app-net  Created                                    0.0s
 ✔ Container dockercompose-db-1   Started                                    0.6s
 ✔ Container dockercompose-web-1  Started                                    0.8s
```

Database data persists across restarts.

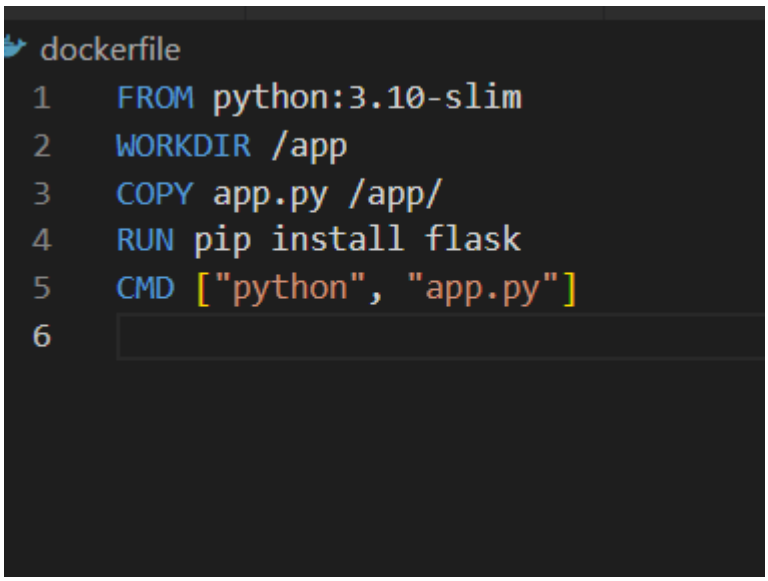
Services communicate via the app-net network using service names.

Task 5: Faster iteration during development

I. **Create a simple Flask app in app.py:**

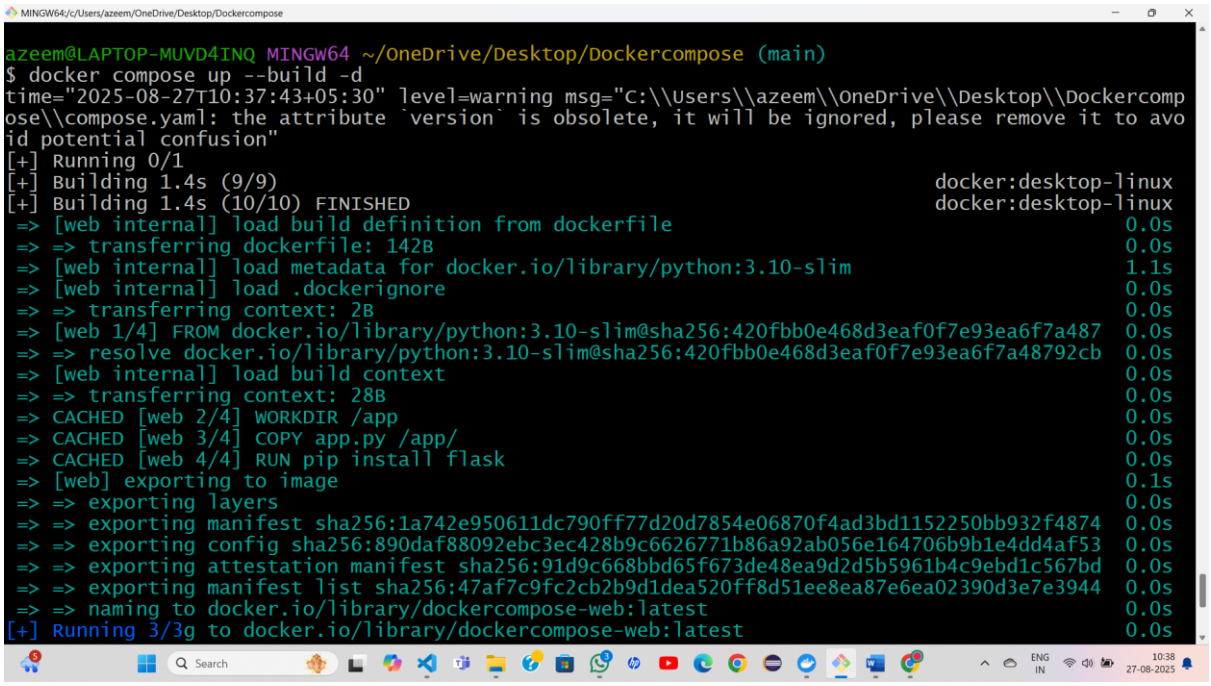
```
p.py > ...
from flask import Flask
app = Flask(__name__)
@app.route("/")
def home():
    return "Hello from Flask + Docker!"
if __name__ == "__main__":
    app.run(host="0.0.0.0", port=5000)
```

II. Add a Dockerfile in the same folder:



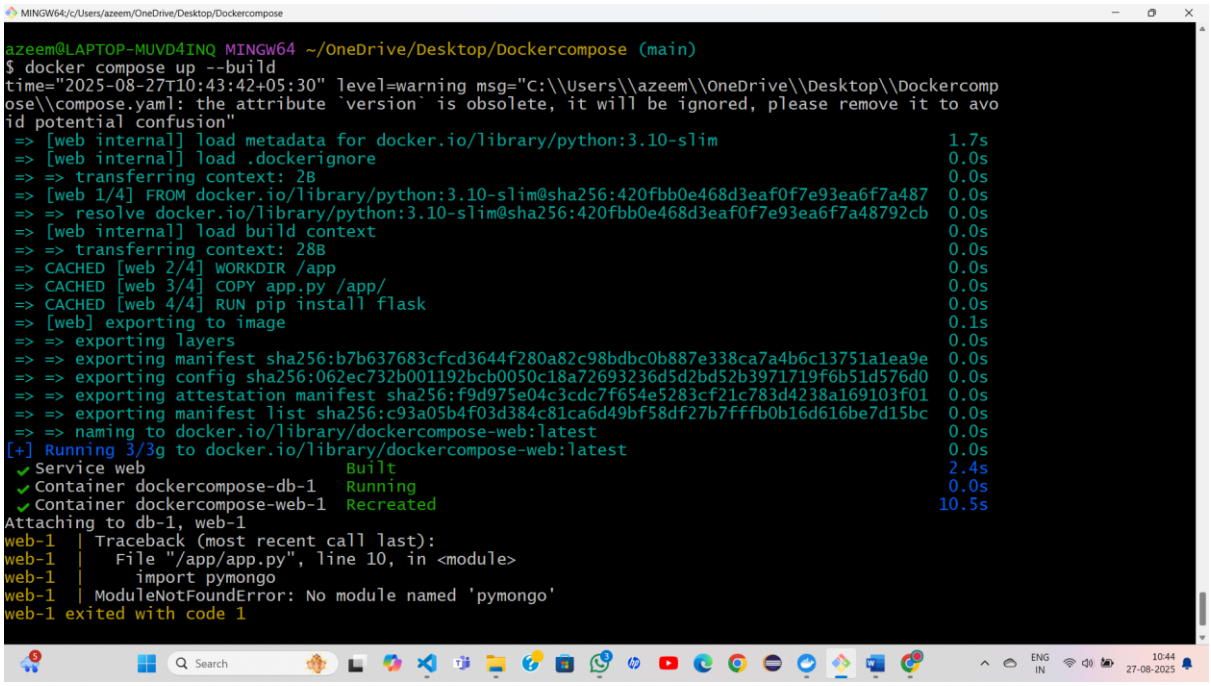
III. Update docker-compose.yml:

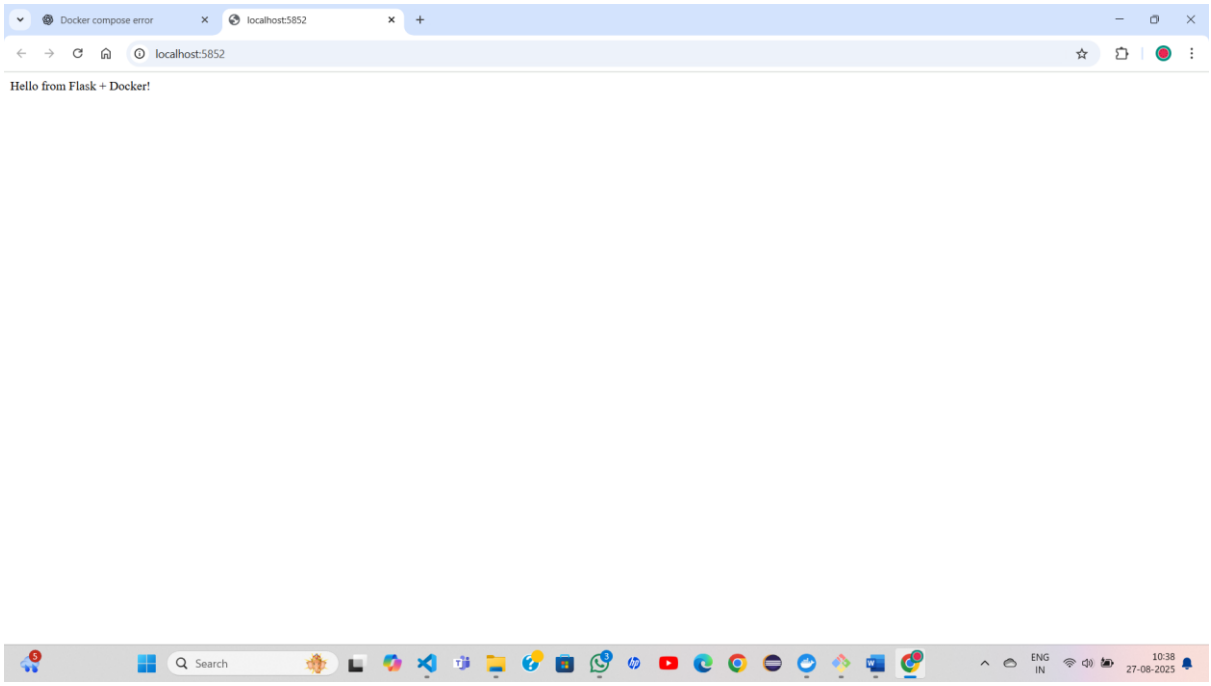

mpose.yaml
services:
web:
build: .
ports:
- "5852:5000"
depends_on:
- db
db:
image: postgres:13
environment:
POSTGRES_USER: user
POSTGRES_PASSWORD: password
POSTGRES_DB: mydb
ports:
- "5432:5432"



IV. Run:

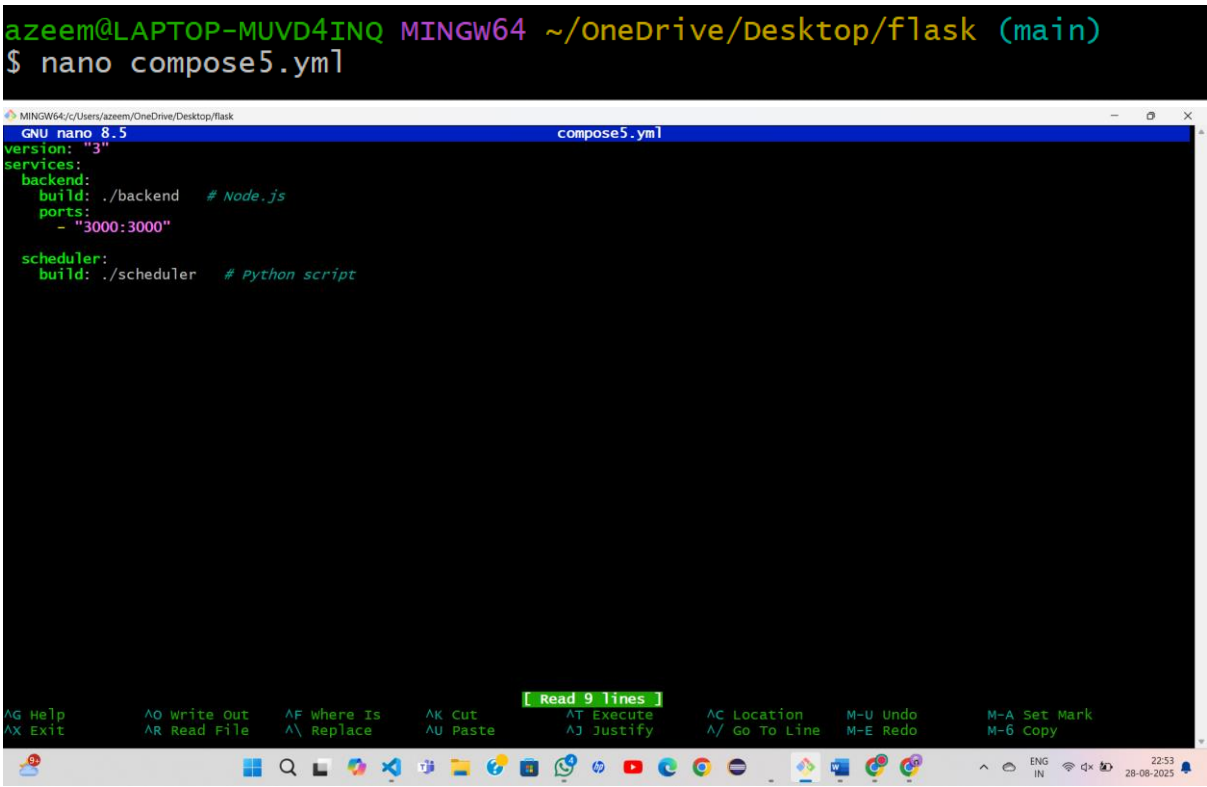
docker compose up --build

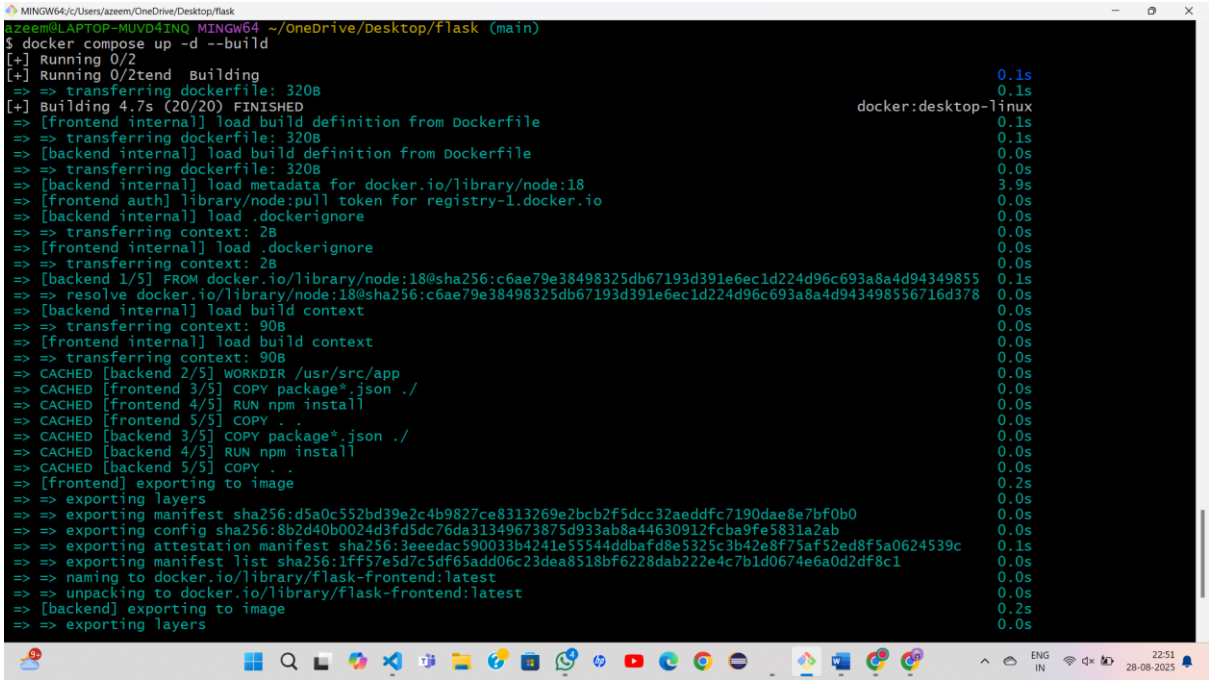




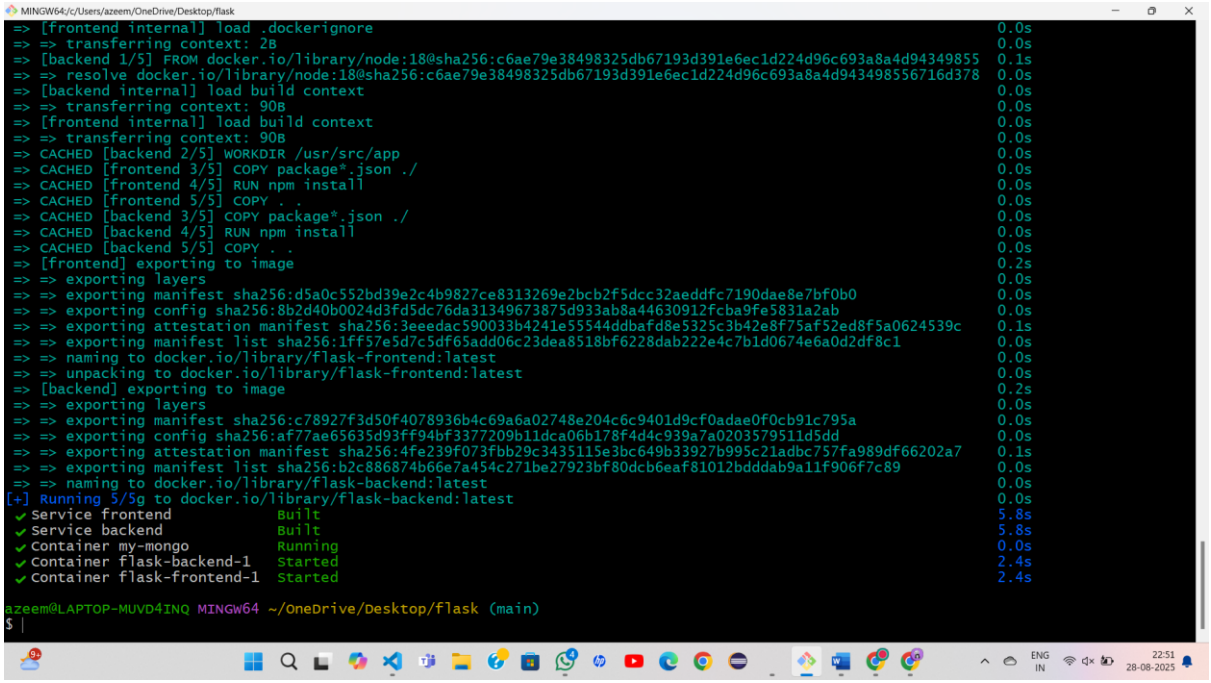
Task 6: Scenario based Questions:

1. You have two applications — a Node.js backend and a Python script that handles scheduled jobs. You're considering running both inside the same container. Should you run multiple applications in the same Docker container?

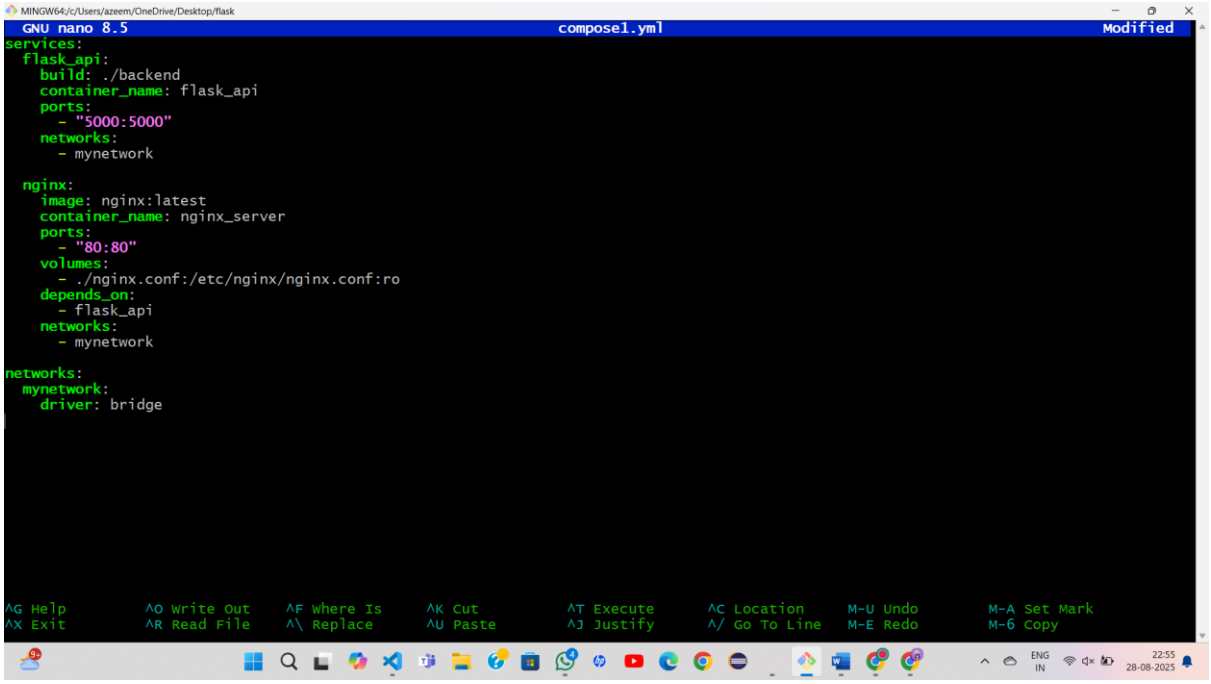




We can use docker compose

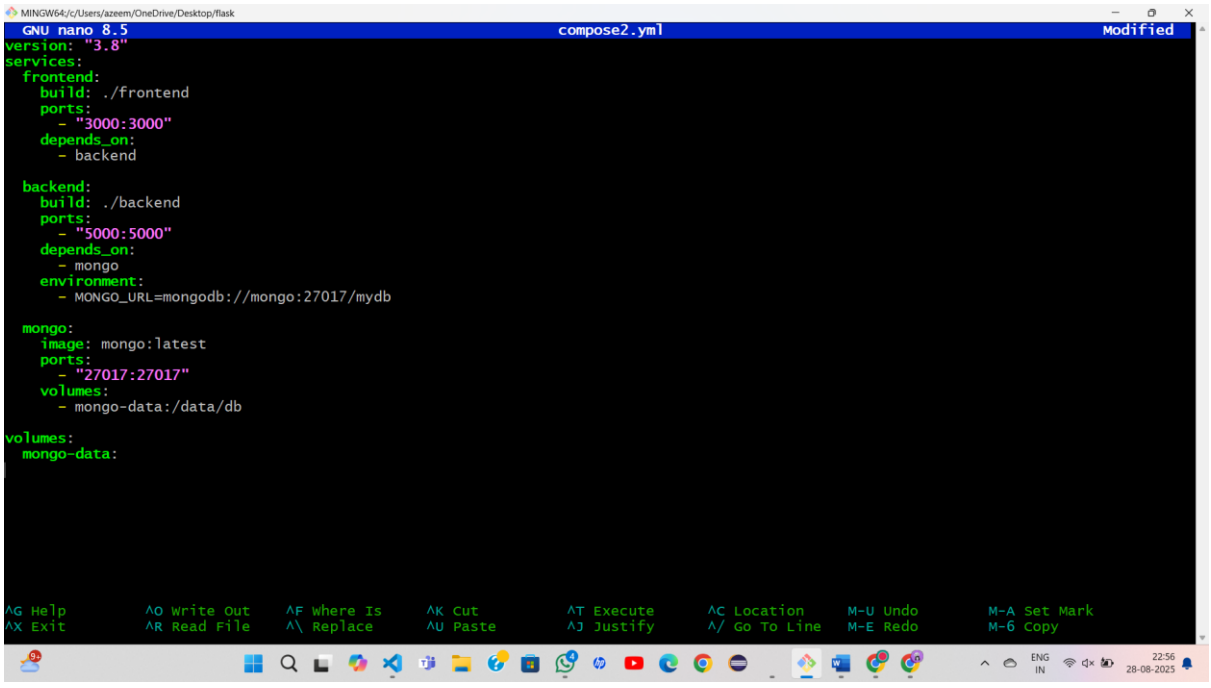


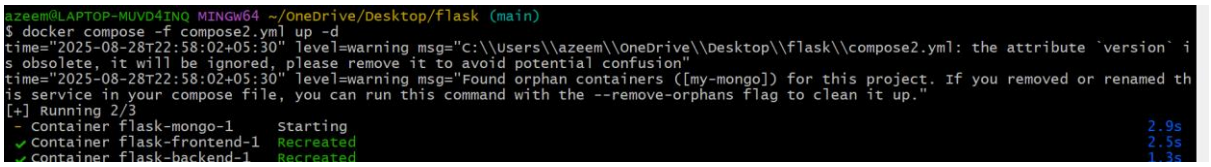
2. You have a Flask API and an Nginx server. You want to run both containers on the same host and expose them on ports 5000 and 80 respectively. How can you expose both applications from different containers?



3. You want to run a React frontend, an Express.js backend and MongoDB – all together.

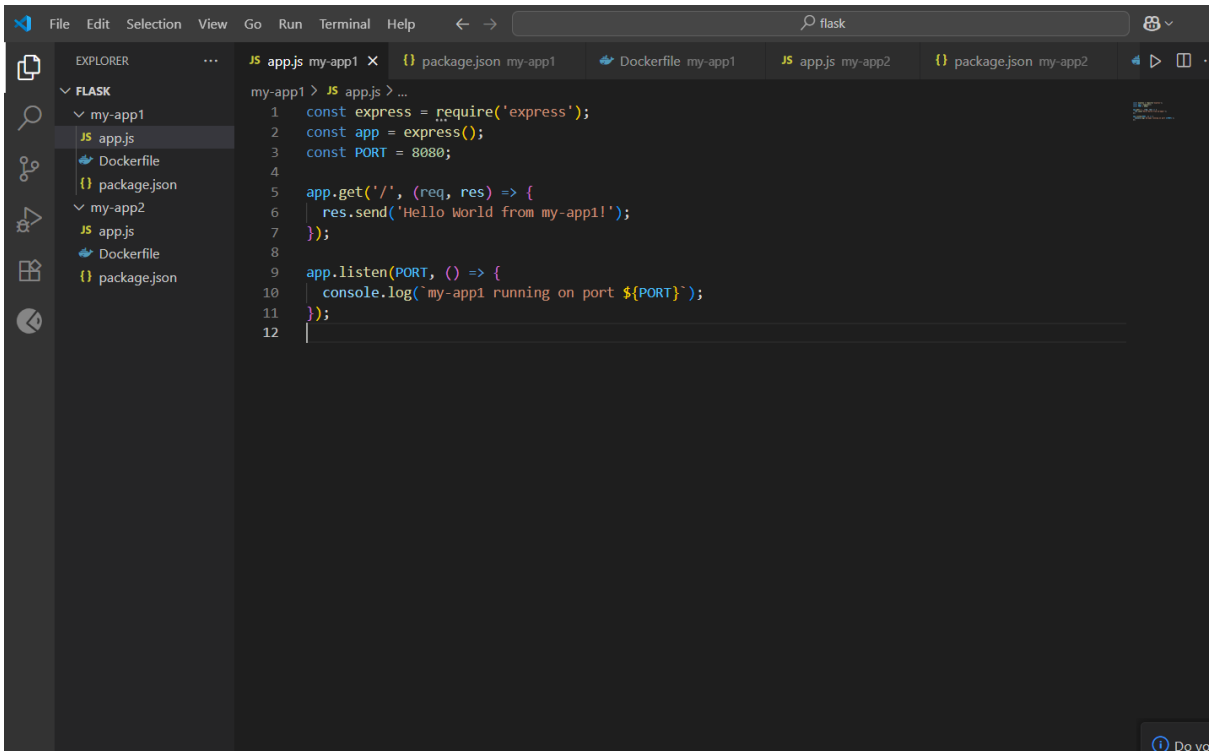
How do you run and manage all three together?

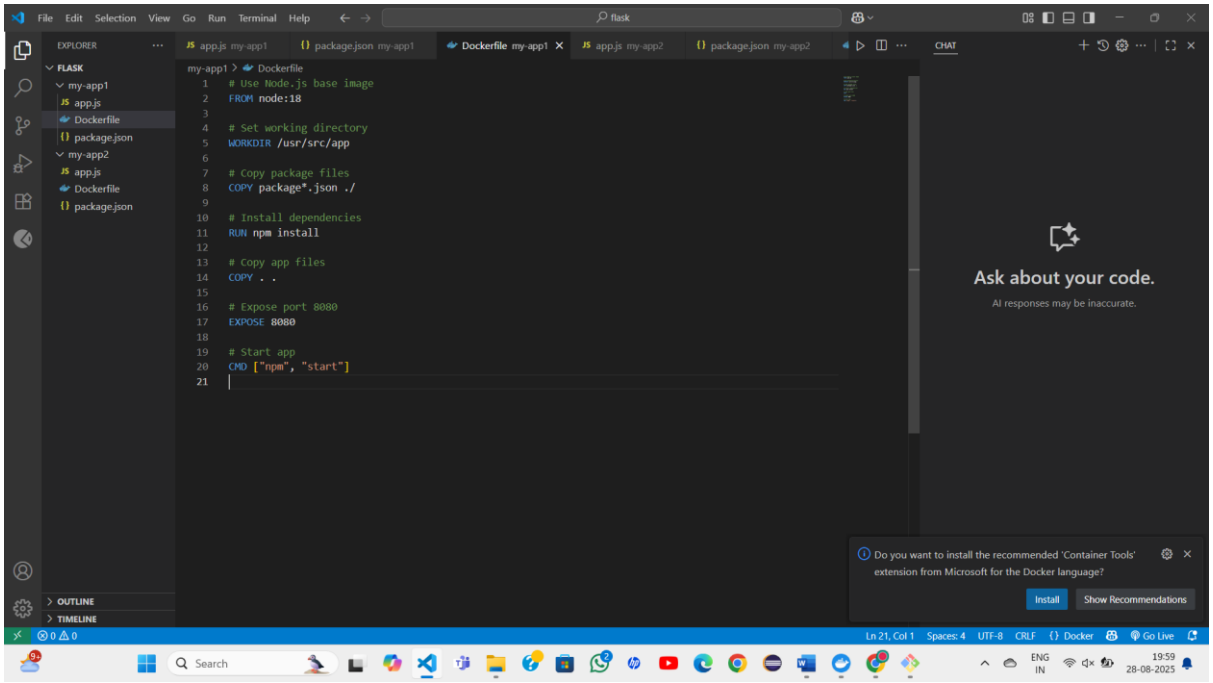


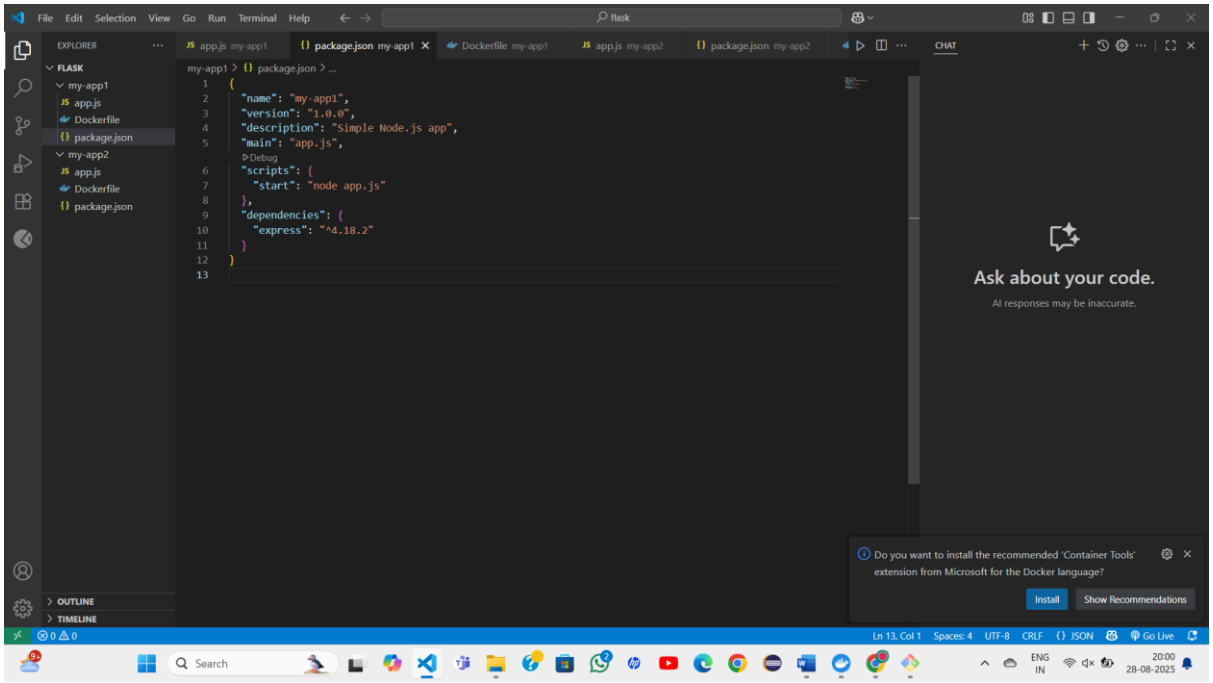


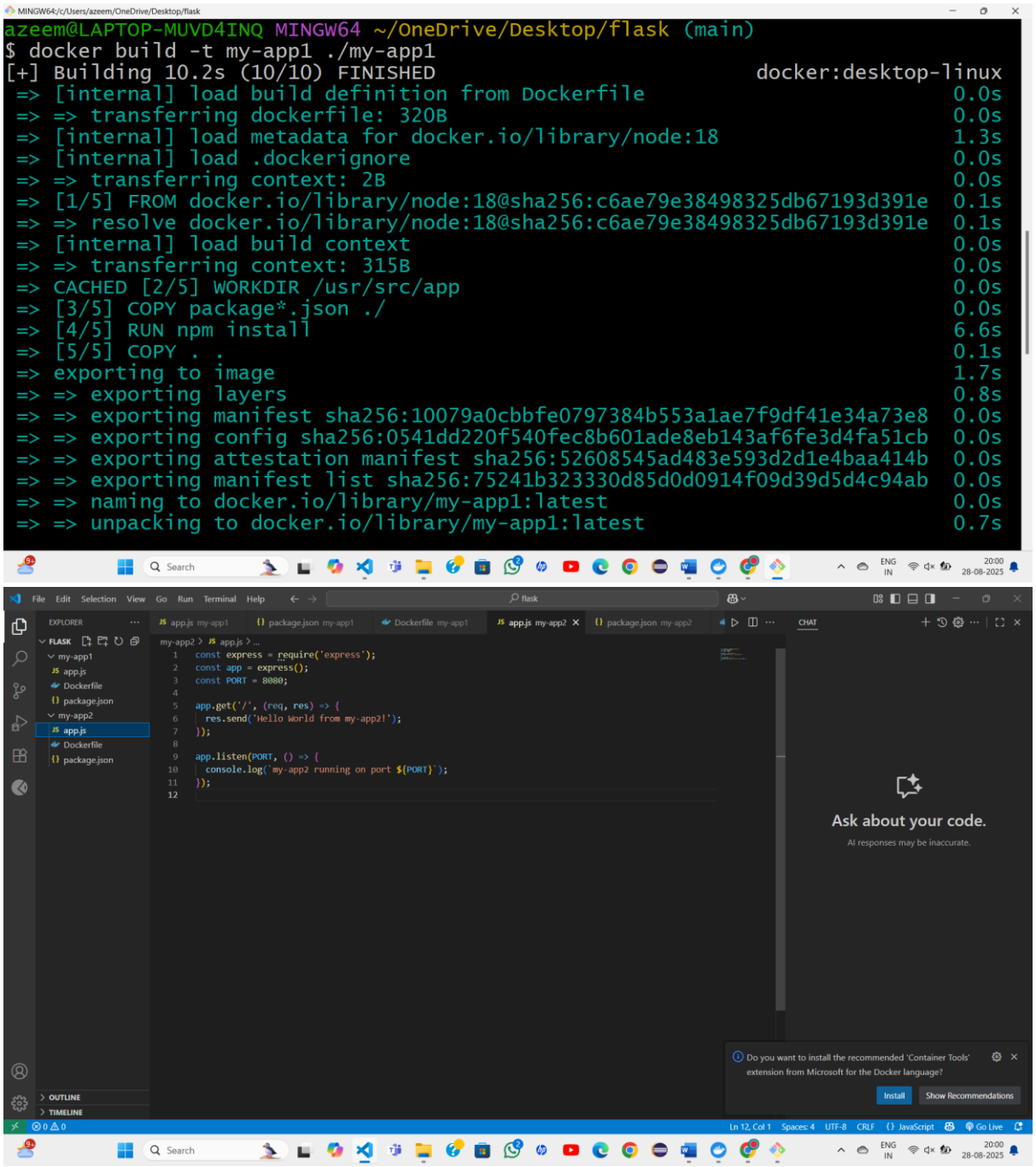
4. You try to run two containers that both expose port 8080 on the host.

What happens, and how can you run both apps?

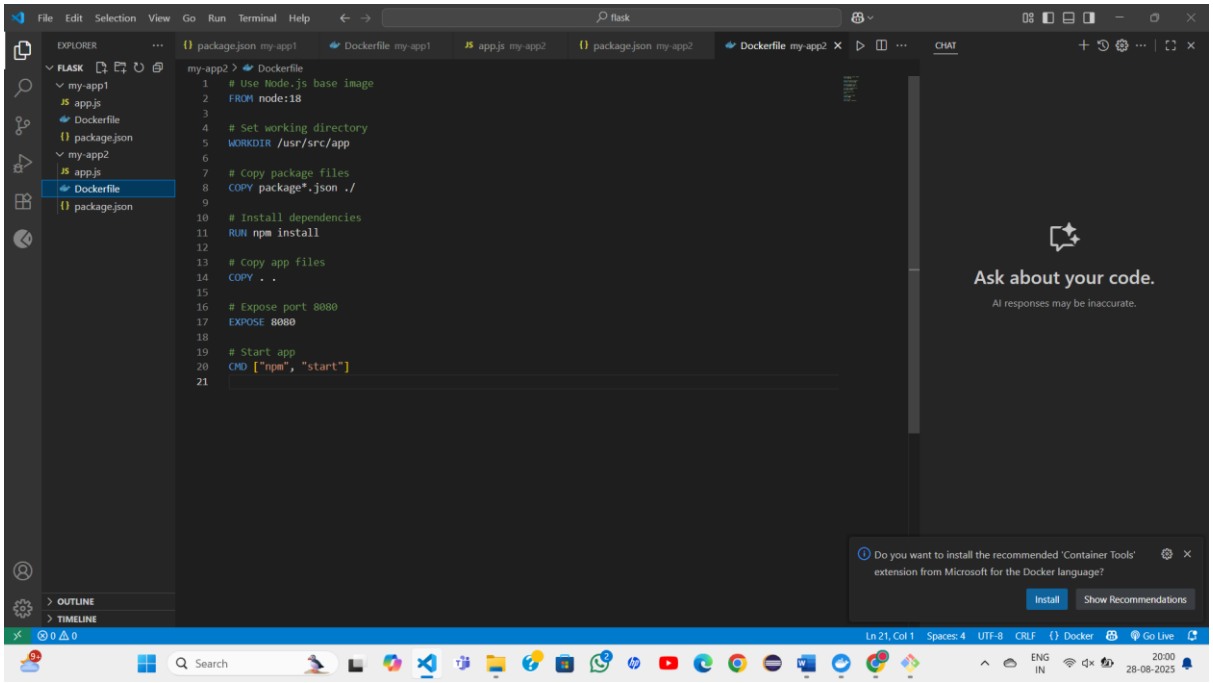



File Edit Selection View Go Run Terminal Help
flask
EXPLORER
FLASK
my-app1
app.js
Dockerfile
package.json
my-app2
app.js
Dockerfile
package.json
app.js my-app1
package.json my-app1
Dockerfile my-app1
app.js my-app2
package.json my-app2
CHAT
my-app1 > Dockerfile
Use Node.js base image
FROM node:18
Set working directory
WORKDIR /usr/src/app
Copy package files
COPY package*.json ./
Install dependencies
RUN npm install
Copy app files
COPY . .
Expose port 8080
EXPOSE 8080
Start app
CMD ["npm", "start"]
Ask about your code.
AI responses may be inaccurate.
Do you want to install the recommended 'Container Tools' extension from Microsoft for the Docker language?
Install
Show Recommendations
OUTLINE
TIMELINE
Ln 21, Col 1 Spaces: 4 UTF-8 CRLF Docker Go Live
Search
ENG IN
19:59
28-08-2025


File Edit Selection View Go Run Terminal Help
flask
EXPLORER
FLASK
my-app1
app.js
Dockerfile
package.json
my-app2
app.js
Dockerfile
package.json
app.js my-app1
package.json my-app1
Dockerfile my-app1
app.js my-app2
package.json my-app2
CHAT
my-app1 > package.json > ...
{
"name": "my-app1",
"version": "1.0.0",
"description": "Simple Node.js app",
"main": "app.js",
Debug
"scripts": {
"start": "node app.js"
},
"dependencies": {
"express": "^4.18.2"
}
}
Ask about your code.
AI responses may be inaccurate.
Do you want to install the recommended 'Container Tools' extension from Microsoft for the Docker language?
Install
Show Recommendations
OUTLINE
TIMELINE
Ln 13, Col 1 Spaces: 4 UTF-8 CRLF JSON Go Live
Search
ENG IN
20:00
28-08-2025


MINGW64:/c/Users/azeem/OneDrive/Desktop/flask
azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/flask (main)
$ docker build -t my-app1 ./my-app1
[+] Building 10.2s (10/10) FINISHED docker:desktop-linux
=> [internal] load build definition from Dockerfile 0.0s
=> => transferring dockerfile: 320B 0.0s
=> [internal] load metadata for docker.io/library/node:18 1.3s
=> [internal] load .dockerignore 0.0s
=> => transferring context: 2B 0.0s
=> [1/5] FROM docker.io/library/node:18@sha256:c6ae79e38498325db67193d391e 0.1s
=> => resolve docker.io/library/node:18@sha256:c6ae79e38498325db67193d391e 0.1s
=> [internal] load build context 0.0s
=> => transferring context: 315B 0.0s
=> CACHED [2/5] WORKDIR /usr/src/app 0.0s
=> [3/5] COPY package*.json ./ 0.0s
=> [4/5] RUN npm install 6.6s
=> [5/5] COPY . . 0.1s
=> exporting to image 1.7s
=> => exporting layers 0.8s
=> => exporting manifest sha256:10079a0cbbfe0797384b553a1ae7f9df41e34a73e8 0.0s
=> => exporting config sha256:0541dd220f540fec8b601ade8eb143af6fe3d4fa51cb 0.0s
=> => exporting attestation manifest sha256:52608545ad483e593d2d1e4baa414b 0.0s
=> => exporting manifest list sha256:75241b323330d85d0d0914f09d39d5d4c94ab 0.0s
=> => naming to docker.io/library/my-app1:latest 0.0s
=> => unpacking to docker.io/library/my-app1:latest 0.7s
Search
ENG IN
20:00 28-08-2025

File Edit Selection View Go Run Terminal Help
flask
EXPLORER
FLASK
my-app1
app.js
Dockerfile
package.json
my-app2
app.js
Dockerfile
package.json
app.js my-app1
package.json my-app1
Dockerfile my-app1
app.js my-app2
package.json my-app2
my-app2 > app.js > ...
1 const express = require('express');
2 const app = express();
3 const PORT = 8080;
4
5 app.get('/', (req, res) => {
6 res.send('Hello World from my-app2!');
7 });
8
9 app.listen(PORT, () => {
10 console.log(`my-app2 running on port ${PORT}`);
11 });
12
CHAT
Ask about your code.
AI responses may be inaccurate.
Do you want to install the recommended 'Container Tools' extension from Microsoft for the Docker language?
Install
Show Recommendations
OUTLINE
TIMELINE
Ln 12, Col 1 Spaces: 4 UTF-8 CRLF JavaScript Go Live
Search
ENG IN
20:00 28-08-2025


File Edit Selection View Go Run Terminal Help
flask
EXPLORER
FLASK
my-app1
app.js
Dockerfile
package.json
my-app2
app.js
Dockerfile
package.json
package.json my-app1
Dockerfile my-app1
app.js my-app2
package.json my-app2
Dockerfile my-app2
CHAT
my-app2 > Dockerfile
Use Node.js base image
FROM node:18
Set working directory
WORKDIR /usr/src/app
Copy package files
COPY package*.json ./
Install dependencies
RUN npm install
Copy app files
COPY . .
Expose port 8080
EXPOSE 8080
Start app
CMD ["npm", "start"]
Ask about your code.
AI responses may be inaccurate.
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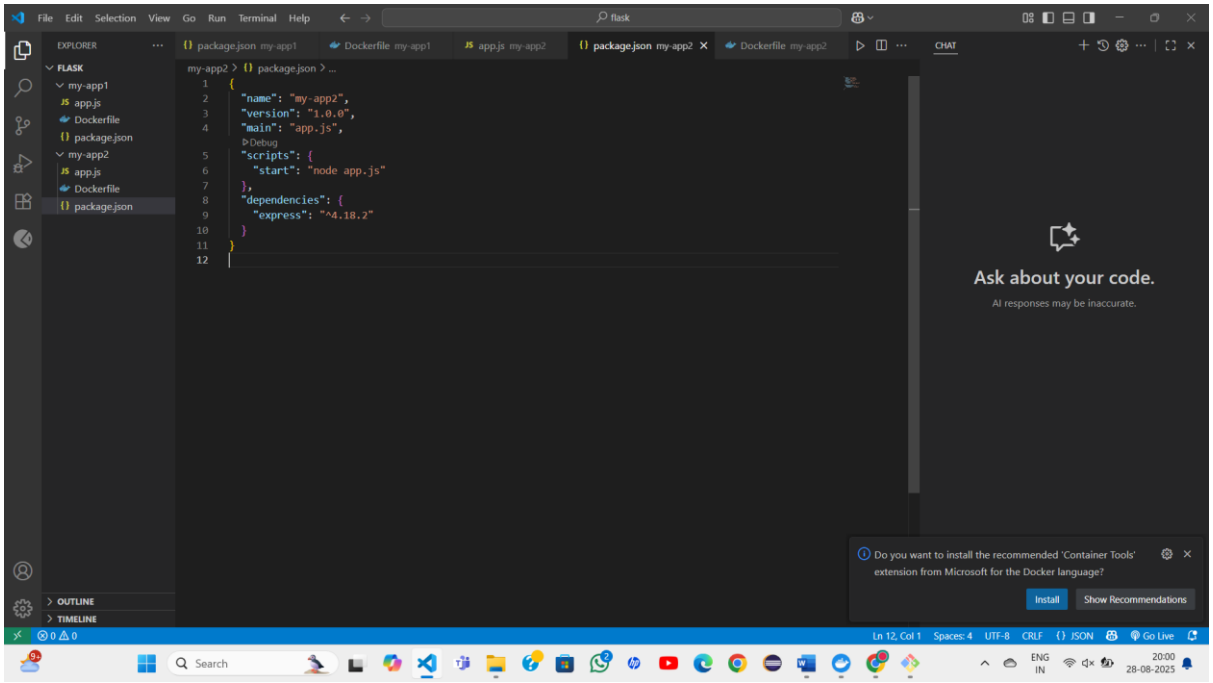
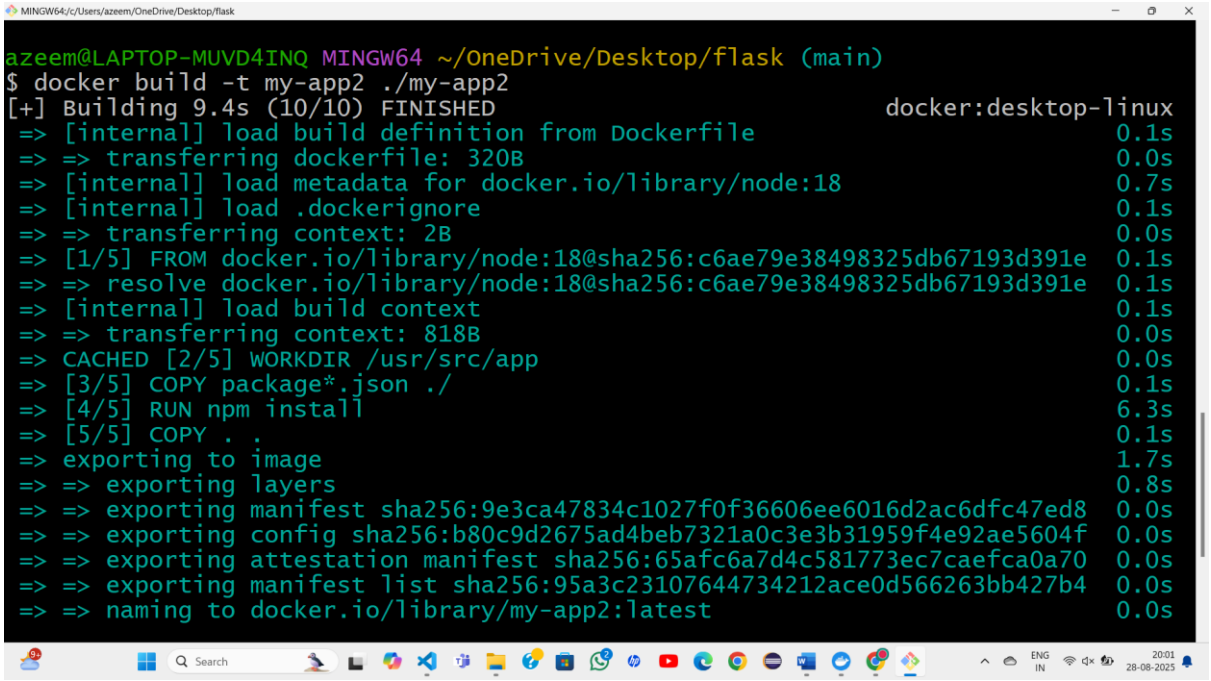
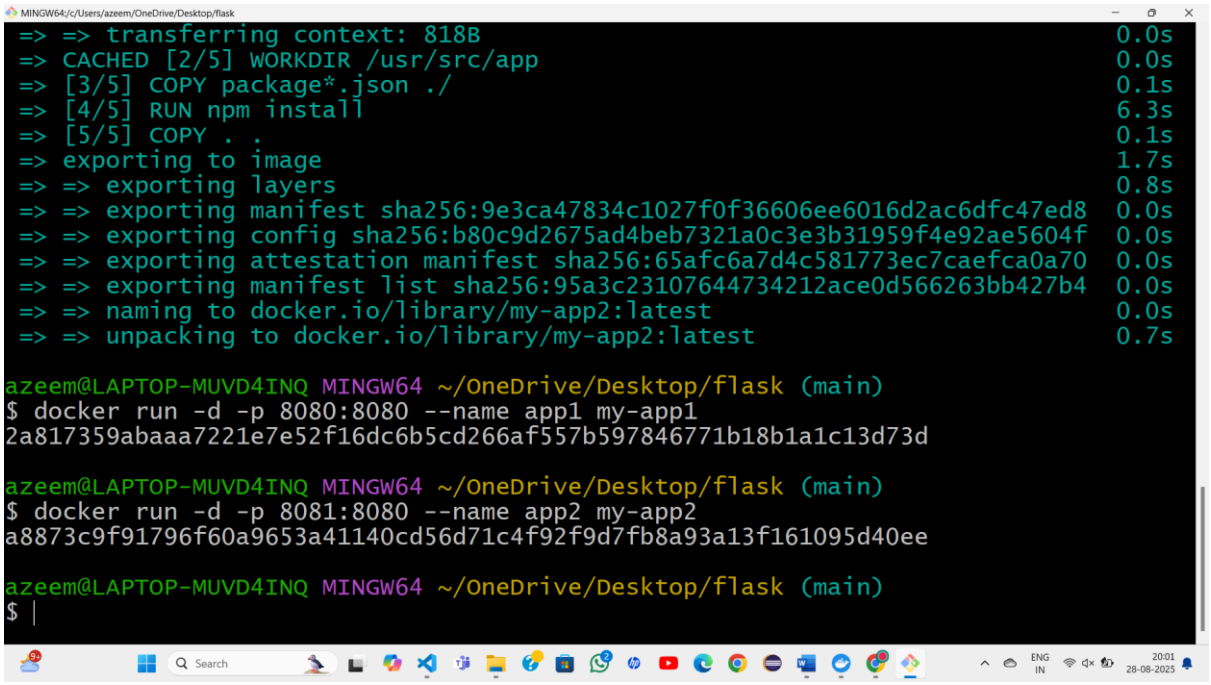
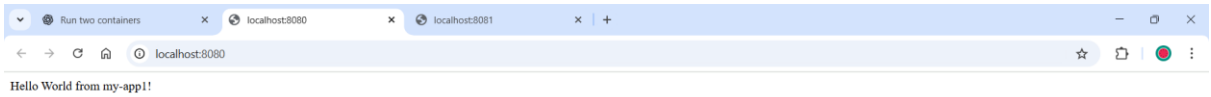
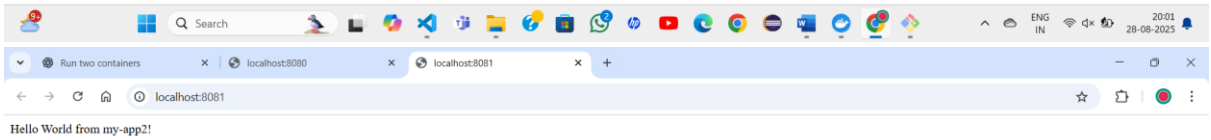
Install
Show Recommendations
OUTLINE
TIMELINE
Ln 21, Col 1 Spaces: 4 UTF-8 CRLF Docker Go Live
Search
ENG IN
20:00 28-08-2025

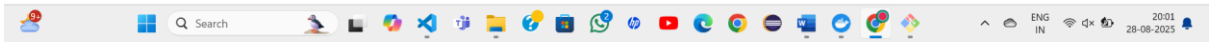

File Edit Selection View Go Run Terminal Help
flask
EXPLORER
FLASK
my-app1
app.js
Dockerfile
package.json
my-app2
app.js
Dockerfile
package.json
package.json my-app1
Dockerfile my-app1
app.js my-app2
package.json my-app2
Dockerfile my-app2
CHAT
my-app2 > package.json > ...
{
"name": "my-app2",
"version": "1.0.0",
"main": "app.js",
Debug
"scripts": {
"start": "node app.js"
},
"dependencies": {
"express": "^4.18.2"
}
}
Ask about your code.
AI responses may be inaccurate.
Do you want to install the recommended 'Container Tools' extension from Microsoft for the Docker language?
Install
Show Recommendations
OUTLINE
TIMELINE
Ln 12, Col 1 Spaces: 4 UTF-8 CRLF JSON Go Live
Search
ENG IN
20:00 28-08-2025


MINGW64:/c/Users/azeem/OneDrive/Desktop/flask
azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/flask (main)
$ docker build -t my-app2 ./my-app2
[+] Building 9.4s (10/10) FINISHED docker:desktop-linux
=> [internal] load build definition from Dockerfile 0.1s
=> => transferring dockerfile: 320B 0.0s
=> [internal] load metadata for docker.io/library/node:18 0.7s
=> [internal] load .dockerignore 0.1s
=> => transferring context: 2B 0.0s
=> [1/5] FROM docker.io/library/node:18@sha256:c6ae79e38498325db67193d391e 0.1s
=> => resolve docker.io/library/node:18@sha256:c6ae79e38498325db67193d391e 0.1s
=> [internal] load build context 0.1s
=> => transferring context: 818B 0.0s
=> CACHED [2/5] WORKDIR /usr/src/app 0.0s
=> [3/5] COPY package*.json ./ 0.1s
=> [4/5] RUN npm install 6.3s
=> [5/5] COPY . . 0.1s
=> exporting to image 1.7s
=> => exporting layers 0.8s
=> => exporting manifest sha256:9e3ca47834c1027f0f36606ee6016d2ac6dfc47ed8 0.0s
=> => exporting config sha256:b80c9d2675ad4beb7321a0c3e3b31959f4e92ae5604f 0.0s
=> => exporting attestation manifest sha256:65afc6a7d4c581773ec7caefca0a70 0.0s
=> => exporting manifest list sha256:95a3c23107644734212ace0d566263bb427b4 0.0s
=> => naming to docker.io/library/my-app2:latest 0.0s


MINGW64:/c/Users/azeem/OneDrive/Desktop/flask
=> => transferring context: 818B 0.0s
=> CACHED [2/5] WORKDIR /usr/src/app 0.0s
=> [3/5] COPY package*.json ./ 0.1s
=> [4/5] RUN npm install 6.3s
=> [5/5] COPY . . 0.1s
=> exporting to image 1.7s
=> => exporting layers 0.8s
=> => exporting manifest sha256:9e3ca47834c1027f0f36606ee6016d2ac6dfc47ed8 0.0s
=> => exporting config sha256:b80c9d2675ad4beb7321a0c3e3b31959f4e92ae5604f 0.0s
=> => exporting attestation manifest sha256:65afc6a7d4c581773ec7caefca0a70 0.0s
=> => exporting manifest list sha256:95a3c23107644734212ace0d566263bb427b4 0.0s
=> => naming to docker.io/library/my-app2:latest 0.0s
=> => unpacking to docker.io/library/my-app2:latest 0.7s
azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/flask (main)
$ docker run -d -p 8080:8080 --name app1 my-app1
2a817359abaaa7221e7e52f16dc6b5cd266af557b597846771b18b1a1c13d73d
azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/flask (main)
$ docker run -d -p 8081:8080 --name app2 my-app2
a8873c9f91796f60a9653a41140cd56d71c4f92f9d7fb8a93a13f161095d40ee
azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/flask (main)
$







5. You updated some code and want to restart your frontend, backend, and DB containers quickly. What is the easiest way to restart all services?

docker-compose.yml

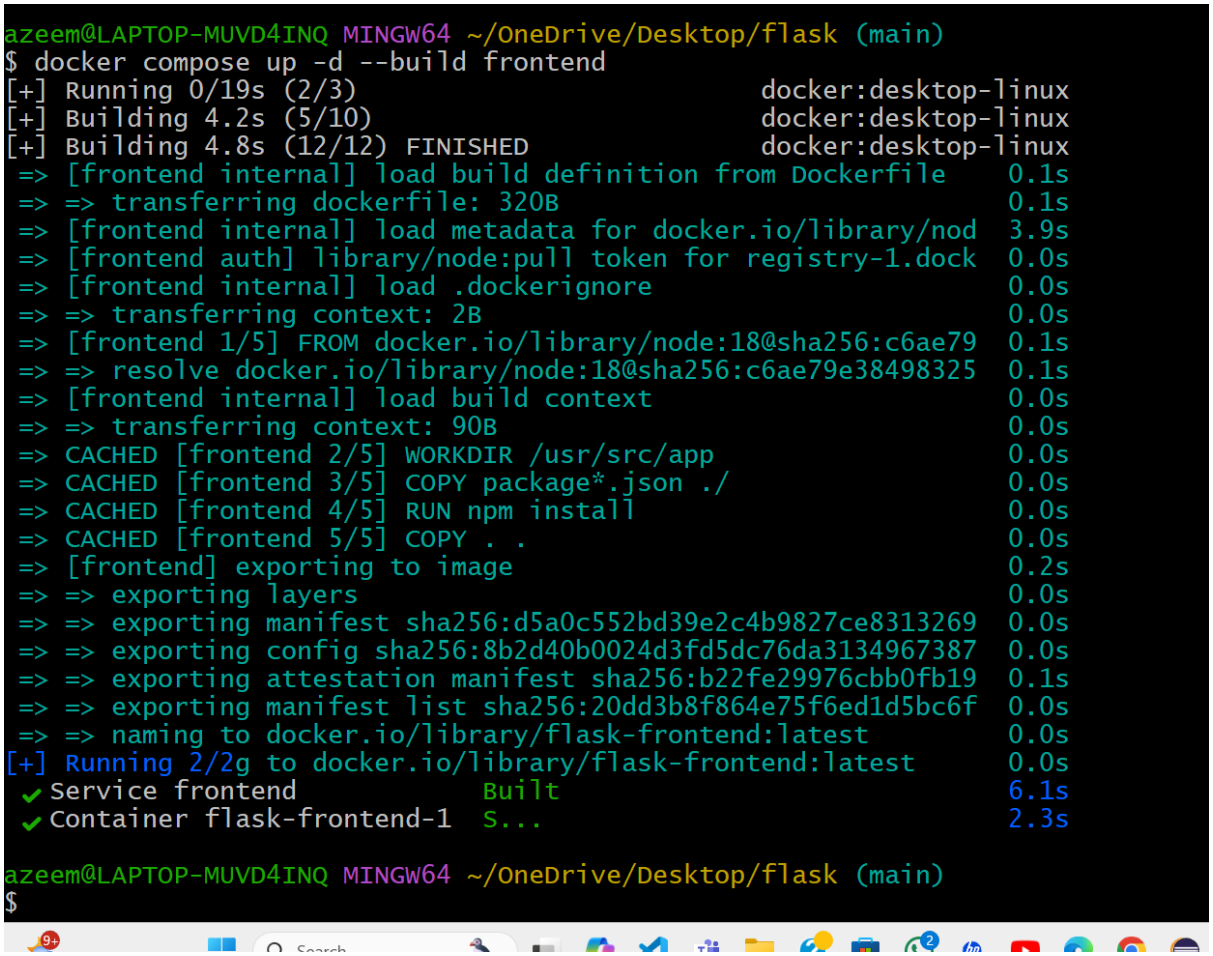
C: > Users > azeem > OneDrive > Desktop > flask > docker-compose.yml

```yaml

services:
  frontend:
    build: ./my-app1
    ports:
      - "8080:8080"

  backend:
    build: ./my-app2
    ports:
      - "8081:8080"

  db:
    image: mongo:6
    container_name: my-mongo
    ports:
      - "27017:27017"
    volumes:
      - mongo-data:/data/db

volumes:
  mongo-data:

```

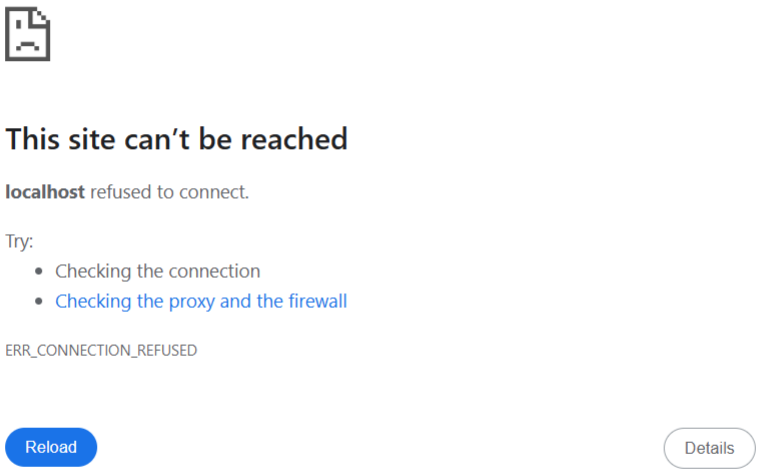
```
azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/flask (main)
$ docker compose restart
[+] Restarting 3/3
 ✔ Container flask-backend-1   St...                    2.1s
 ✔ Container my-mongo          Started                  1.7s
 ✔ Container flask-frontend-1  S...                     2.3s
```

```
azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/flask (main)
$ docker restart 4afa457dd5cb f85f723929d8
4afa457dd5cb
f85f723929d8
```

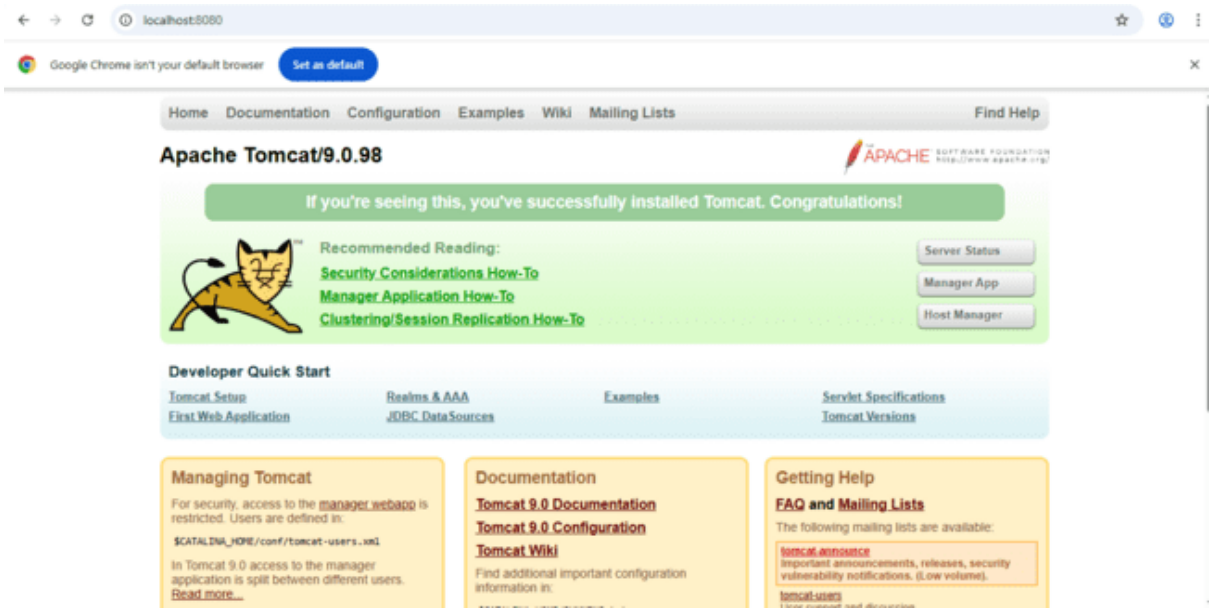
6. Your frontend has a new release, but you don't want to restart the backend or DB.
How can you update and rebuild only the frontend container?



7. Tomcat is listening on port 8080, but you get a "Connection Refused" error in the browser. Why?



"Connection Refused" happens because **the server process (like Tomcat) is not running or not listening on the port (8080), or the port is blocked/not exposed**.



8. You're not sure which container is using port 3000. How do you check?

```
azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/flask (main)
$ docker ps
CONTAINER ID   IMAGE             COMMAND                  CREATED          STATUS          PORTS                      N
AMES
967ff23dc7fe   flask-frontend    "docker-entrypoint.s…"   2 minutes ago    Up 2 minutes    0.0.0.0:8080->8080/tcp     f
lask-frontend-1
4afa457dd5cb   flask-backend     "docker-entrypoint.s…"   11 minutes ago   Up 4 minutes    0.0.0.0:8081->8080/tcp     f
lask-backend-1
64d71b9a03a4   mongo:6           "docker-entrypoint.s…"   11 minutes ago   Up 8 minutes    0.0.0.0:27017->27017/tcp   m
y-mongo
6058c9611591   64825fb4d70a      "docker-entrypoint.s…"   4 days ago       Up 12 minutes   6379/tcp                   m
yapi3
8e0059dd6e07   64825fb4d70a      "docker-entrypoint.s…"   4 days ago       Up 12 minutes   6379/tcp                   m
yapi2
37ade3a69024   64825fb4d70a      "docker-entrypoint.s…"   4 days ago       Up 12 minutes   6379/tcp                   m
yapi

azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/flask (main)
$
```

Here tcp image is running on port 3000

9. How do you stop and clean up your running Tomcat container and image?

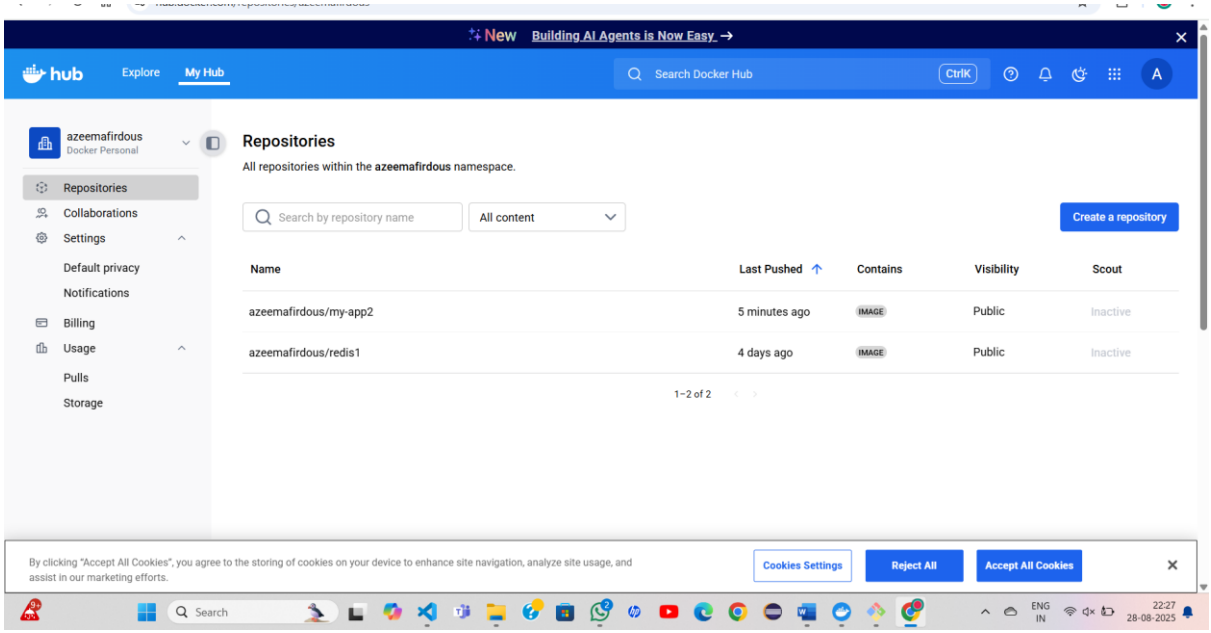
```
azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/flask (main)
$ docker stop 37ade3a69024
37ade3a69024

azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/flask (main)
$ docker rm 37ade3a69024
37ade3a69024
```

10.You want to share your app with a teammate. What do you do with the Docker image?

```
azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/flask (main)
$ docker tag my-app2:latest azeemafirdous/my-app2:latest
```

```
azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/flask (main)
$ docker login
Authenticating with existing credentials...
Login Succeeded
```

```
azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/flask (main)
$ docker push azeemafirdous/my-app2:latest
The push refers to repository [docker.io/azeemafirdous/my-app2]
9f5f6f9cf6cf: Pushed
cda7f44f2bdd: Pushed
79b2f47ad444: Pushed
3e6b9d1a9511: Pushed
34f8cf879920: Pushed
37927ed901b1: Pushed
e23f099911d6: Pushed
c6b30c3f1696: Pushed
2b217bcd967d: Pushed
3697be50c98b: Pushed
e6f934343b41: Pushed
461077a72fb7: Pushed
232fa65e5ce5: Pushed
latest: digest: sha256:95a3c23107644734212ace0d566263bb427b4c2e871b83ef5302e389f9a0640d size: 856
```



So we are storing the image in docker hub whenever a team mate wants it they can pull the image

```
azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/flask (main)
$ docker pull azeemafirdous/redis1
Using default tag: latest
latest: Pulling from azeemafirdous/redis1
Digest: sha256:e39ec005579e3e7d42dc46e573716a2eb10e25e280de35160515d9a7fed4dd16
Status: Downloaded newer image for azeemafirdous/redis1:latest
docker.io/azeemafirdous/redis1:latest

azeem@LAPTOP-MUVD4INQ MINGW64 ~/OneDrive/Desktop/flask (main)
$
```

Prepared by:

Azeema firdous

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CSE-F