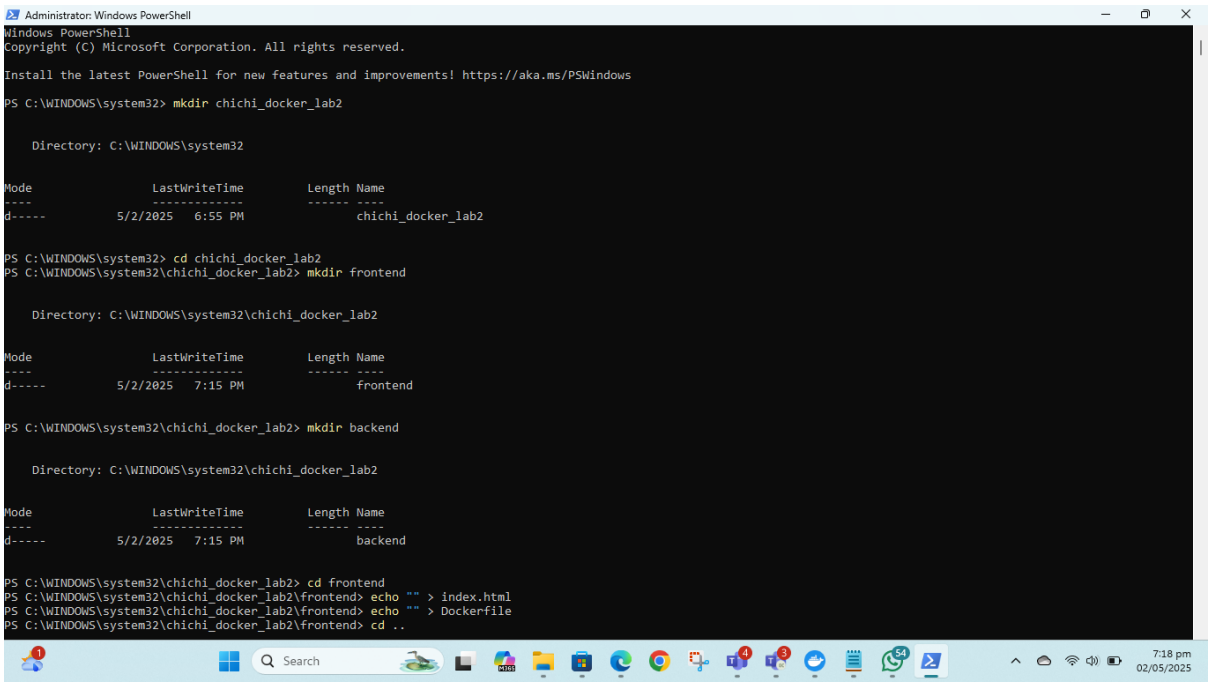
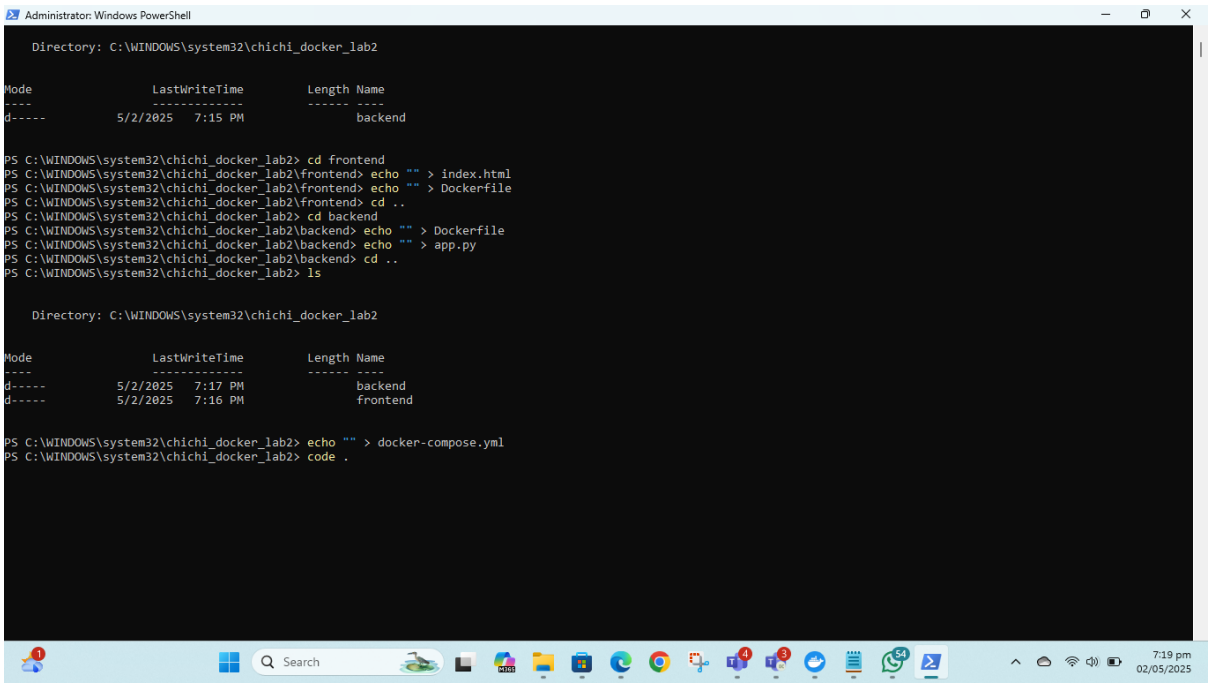
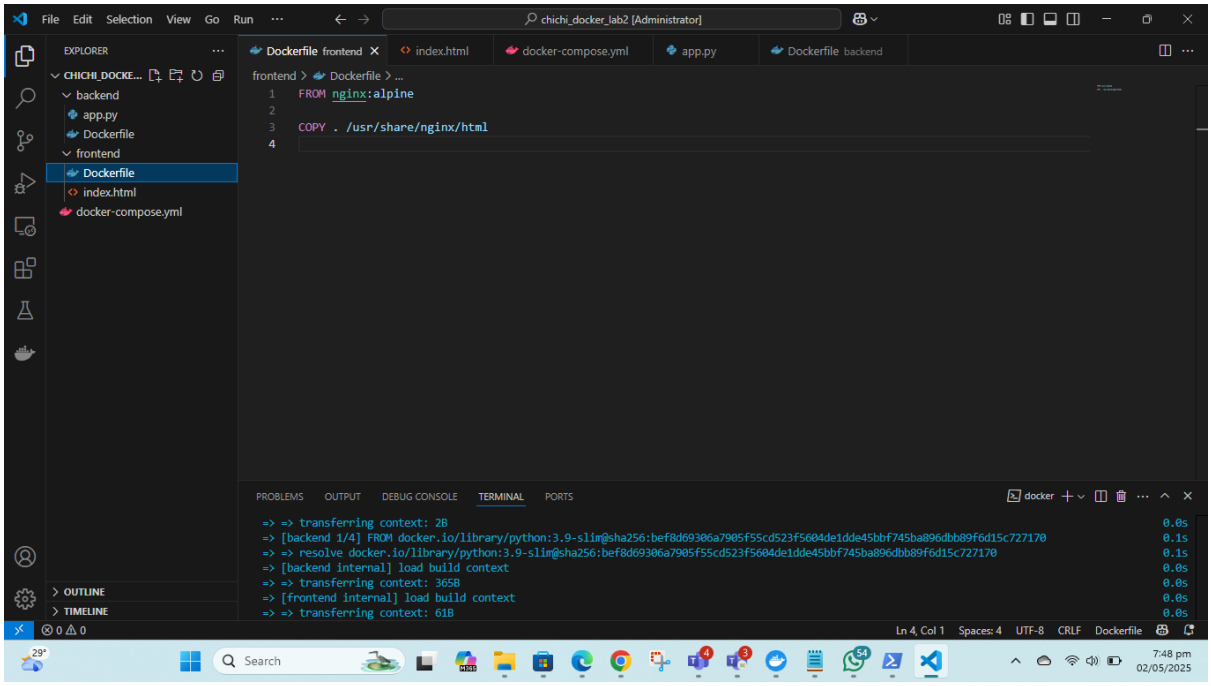
Containerizing a Multi-Service Application with Docker Compose

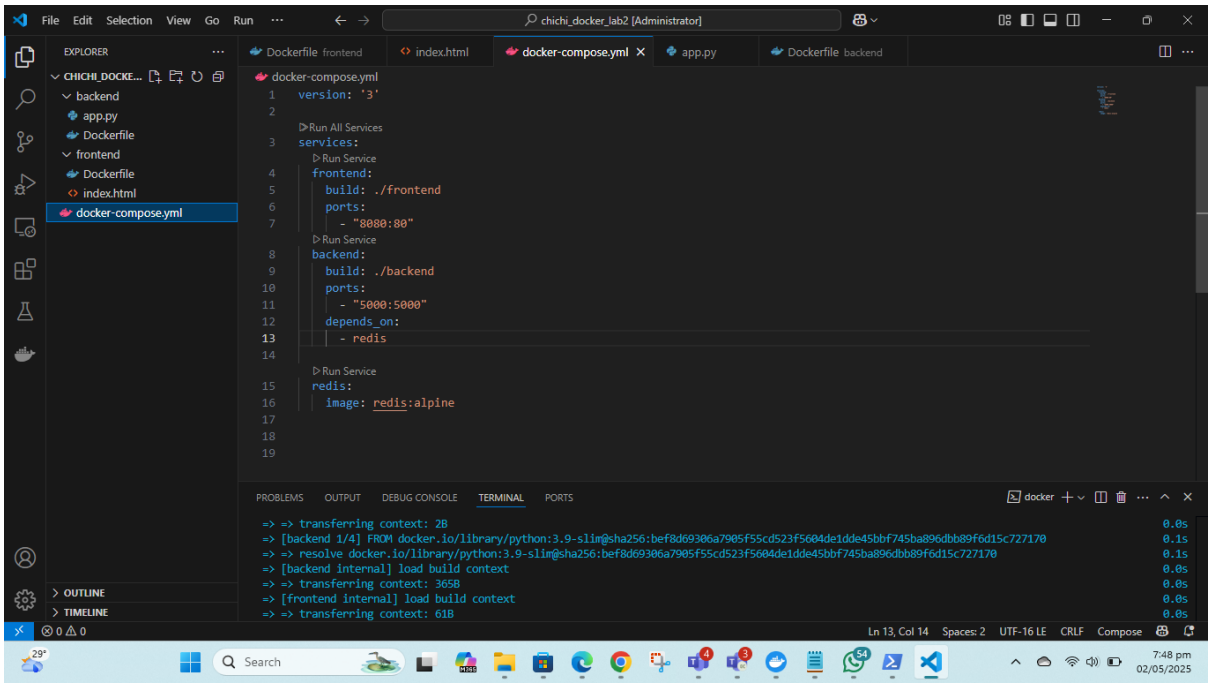
The main objective for this lab was to reduce the workload and hence provide efficiency in creating containers to run multiple services at the same time. A docker compose file was created and based on the docker compose file, multiple container images were created which was used to run containers providing a platform to test and develop business logic. The images created can be used in other platforms compatible with docker.



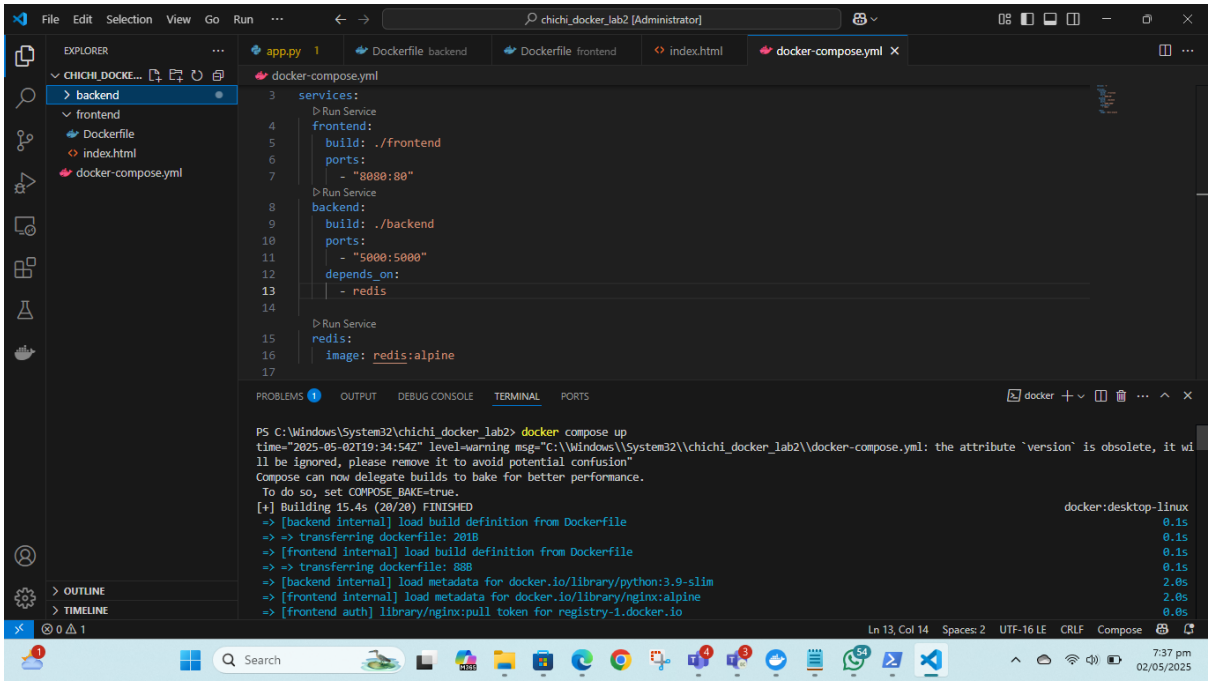


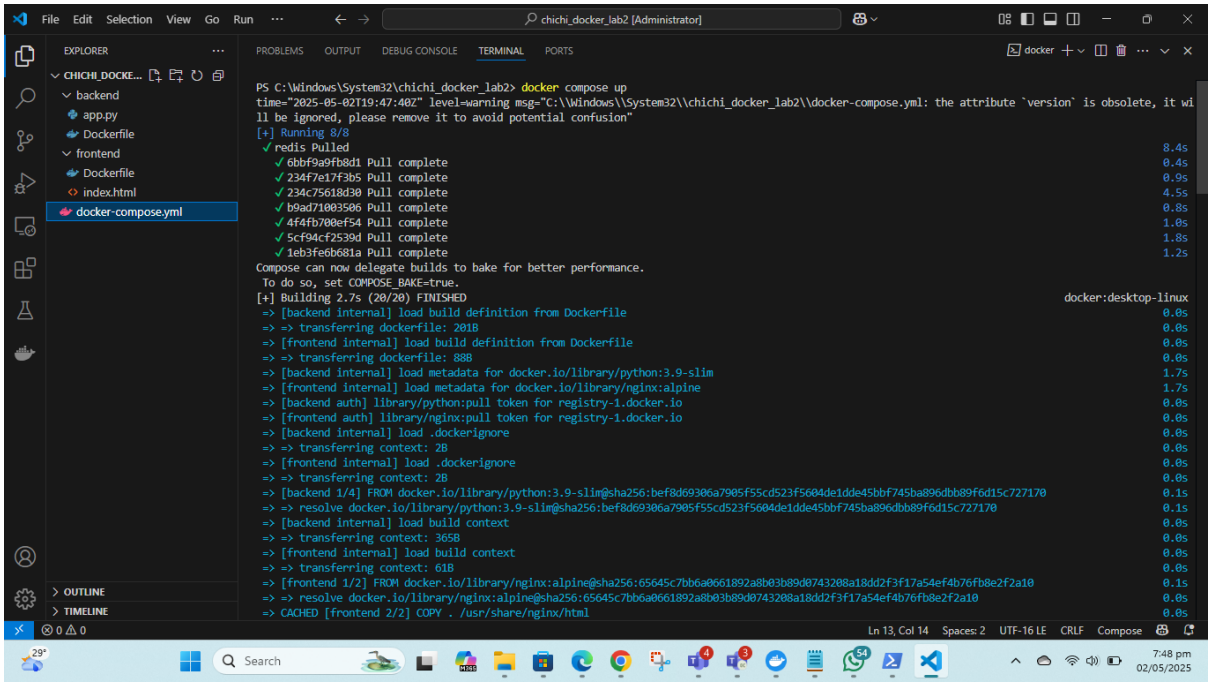


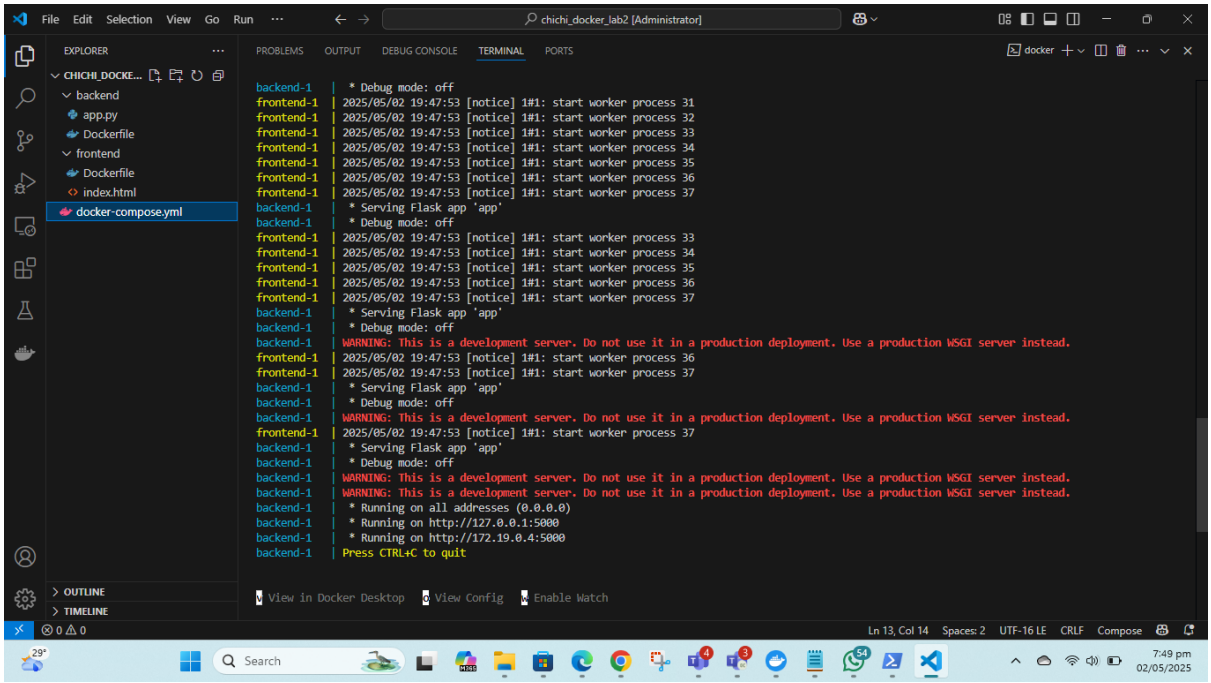
In this lab, two subdirectories named frontend and backend were created. The frontend directory contained an index.html file which served as the main entry point for the frontend application as well as a docker file which was executed to build an image to run a container. The backend directory also contained an app.py file which served as the main entry point for the backend application. The backend application also had its corresponding docker file for the creation of the docker image. The running of the backend application depended on the redis service.

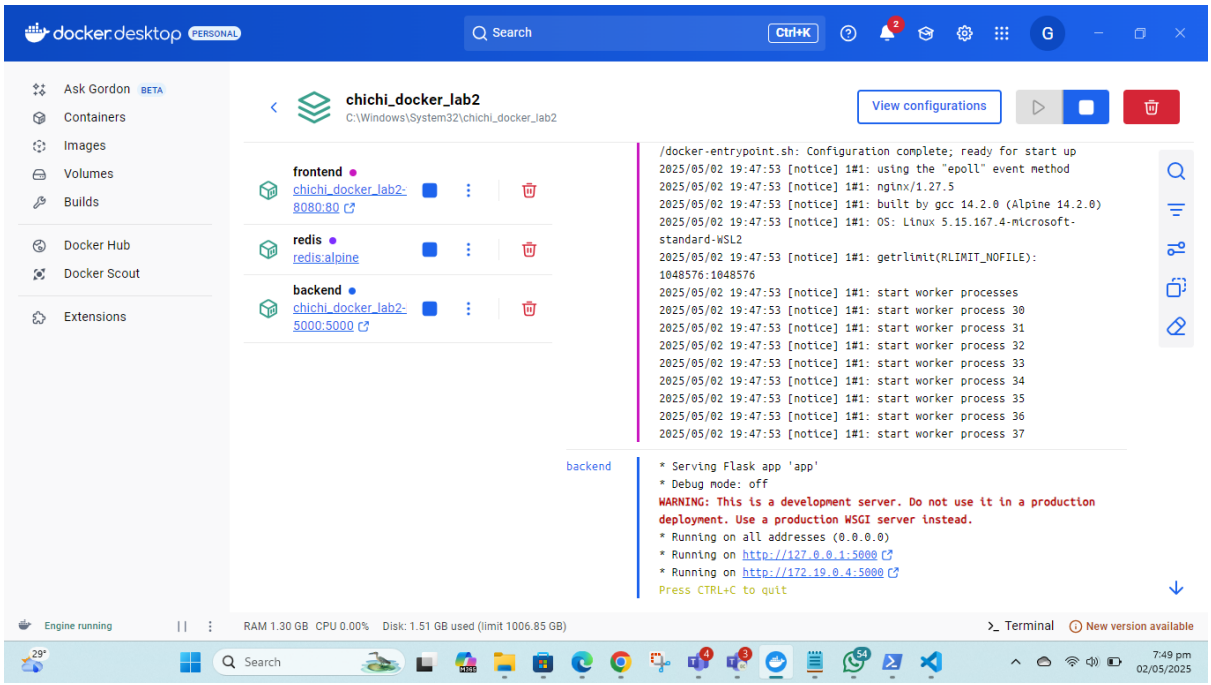


The docker compose file compiled all the services and was used to generate an image for each service. Based on the version of the docker compose file which was version 3, It was able to house and build images for three services (backend, frontend and redis service).






File Edit Selection View Go Run
chichi_docker_lab2 [Administrator]
EXPLORER
CHICHI_DOCKE...
backend
app.py
Dockerfile
frontend
Dockerfile
index.html
docker-compose.yml
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
docker
backend-1 | * Debug mode: off
frontend-1 | 2025/05/02 19:47:53 [notice] 1#1: start worker process 31
frontend-1 | 2025/05/02 19:47:53 [notice] 1#1: start worker process 32
frontend-1 | 2025/05/02 19:47:53 [notice] 1#1: start worker process 33
frontend-1 | 2025/05/02 19:47:53 [notice] 1#1: start worker process 34
frontend-1 | 2025/05/02 19:47:53 [notice] 1#1: start worker process 35
frontend-1 | 2025/05/02 19:47:53 [notice] 1#1: start worker process 36
frontend-1 | 2025/05/02 19:47:53 [notice] 1#1: start worker process 37
backend-1 | * Serving Flask app 'app'
backend-1 | * Debug mode: off
frontend-1 | 2025/05/02 19:47:53 [notice] 1#1: start worker process 33
frontend-1 | 2025/05/02 19:47:53 [notice] 1#1: start worker process 34
frontend-1 | 2025/05/02 19:47:53 [notice] 1#1: start worker process 35
frontend-1 | 2025/05/02 19:47:53 [notice] 1#1: start worker process 36
frontend-1 | 2025/05/02 19:47:53 [notice] 1#1: start worker process 37
backend-1 | * Serving Flask app 'app'
backend-1 | * Debug mode: off
backend-1 | WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
frontend-1 | 2025/05/02 19:47:53 [notice] 1#1: start worker process 36
frontend-1 | 2025/05/02 19:47:53 [notice] 1#1: start worker process 37
backend-1 | * Serving Flask app 'app'
backend-1 | * Debug mode: off
backend-1 | WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
frontend-1 | 2025/05/02 19:47:53 [notice] 1#1: start worker process 37
backend-1 | * Serving Flask app 'app'
backend-1 | * Debug mode: off
backend-1 | WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
backend-1 | WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
backend-1 | * Running on all addresses (0.0.0.0)
backend-1 | * Running on http://127.0.0.1:5000
backend-1 | * Running on http://172.19.0.4:5000
backend-1 | Press CTRL+C to quit
View in Docker Desktop
View Config
Enable Watch
OUTLINE
TIMELINE
Ln 13, Col 14 Spaces: 2 UTF-16 LE CRLF Compose
Search
7:49 pm
02/05/2025


docker desktop PERSONAL
Search Ctrl+K
Ask Gordon BETA
Containers
Images
Volumes
Builds
Docker Hub
Docker Scout
Extensions
chichi_docker_lab2
C:\Windows\System32\chichi_docker_lab2
View configurations
frontend
chichi_docker_lab2-8080:80
redis
redis:alpine
backend
chichi_docker_lab2-5000:5000
/docker-entrypoint.sh: Configuration complete; ready for start up
2025/05/02 19:47:53 [notice] 1#1: using the "epoll" event method
2025/05/02 19:47:53 [notice] 1#1: nginx/1.27.5
2025/05/02 19:47:53 [notice] 1#1: built by gcc 14.2.0 (Alpine 14.2.0)
2025/05/02 19:47:53 [notice] 1#1: OS: Linux 5.15.167.4-microsoft-standard-WSL2
2025/05/02 19:47:53 [notice] 1#1: getrlimit(RLIMIT_NOFILE): 1048576:1048576
2025/05/02 19:47:53 [notice] 1#1: start worker processes
2025/05/02 19:47:53 [notice] 1#1: start worker process 30
2025/05/02 19:47:53 [notice] 1#1: start worker process 31
2025/05/02 19:47:53 [notice] 1#1: start worker process 32
2025/05/02 19:47:53 [notice] 1#1: start worker process 33
2025/05/02 19:47:53 [notice] 1#1: start worker process 34
2025/05/02 19:47:53 [notice] 1#1: start worker process 35
2025/05/02 19:47:53 [notice] 1#1: start worker process 36
2025/05/02 19:47:53 [notice] 1#1: start worker process 37
backend
* Serving Flask app 'app'
* Debug mode: off
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
* Running on all addresses (0.0.0.0)
* Running on http://127.0.0.1:5000
* Running on http://172.19.0.4:5000
Press CTRL+C to quit
Engine running
RAM 1.30 GB CPU 0.00% Disk: 1.51 GB used (limit 1006.85 GB)
Terminal
New version available
Search
7:49 pm
02/05/2025

index.html

Hello, welcome to our application! I'm Gertrude Chichi, and I'm excited to have you here. Our team is working hard to bring you the best experience possible. Stay tuned for updates and new features! !

This is a sample HTML page.

Hello, World!