National Textile University

Department of Computer Science

Subject:

Operating System

Submitted to:

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Submitted by:

Akasha Fatima

Reg. number:

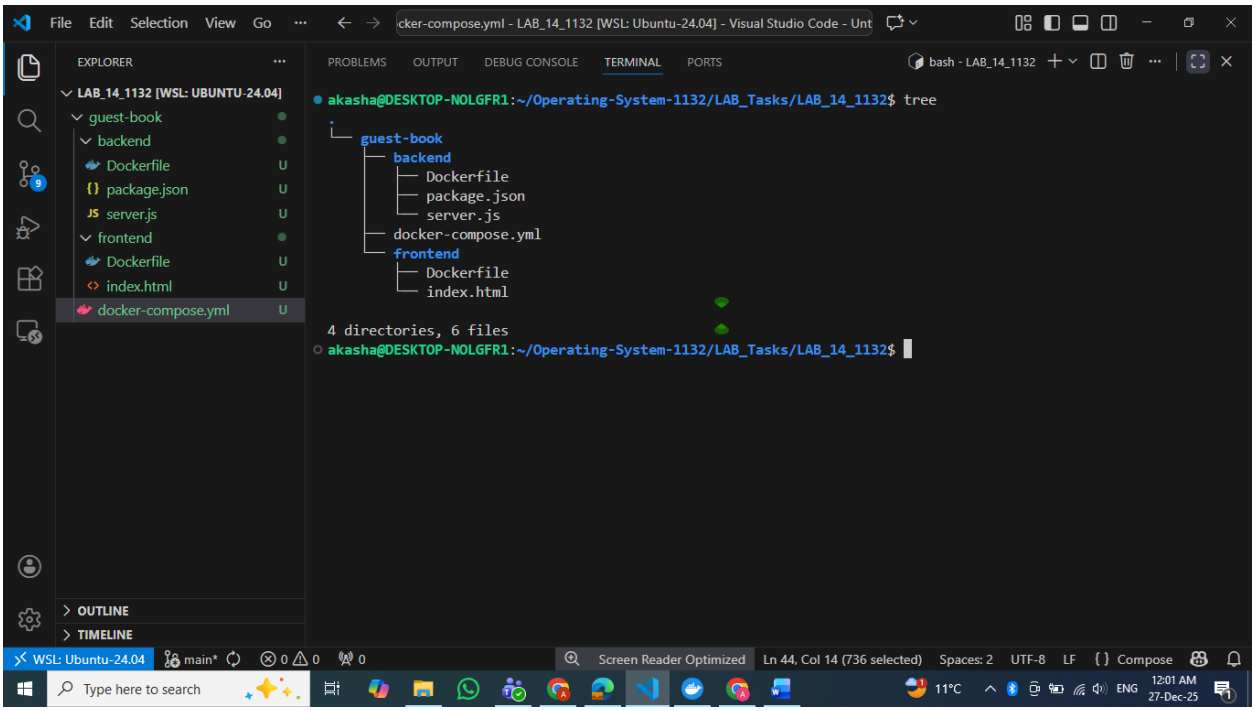
23-NTU-CS-FL-1132

Semester:

5th - A

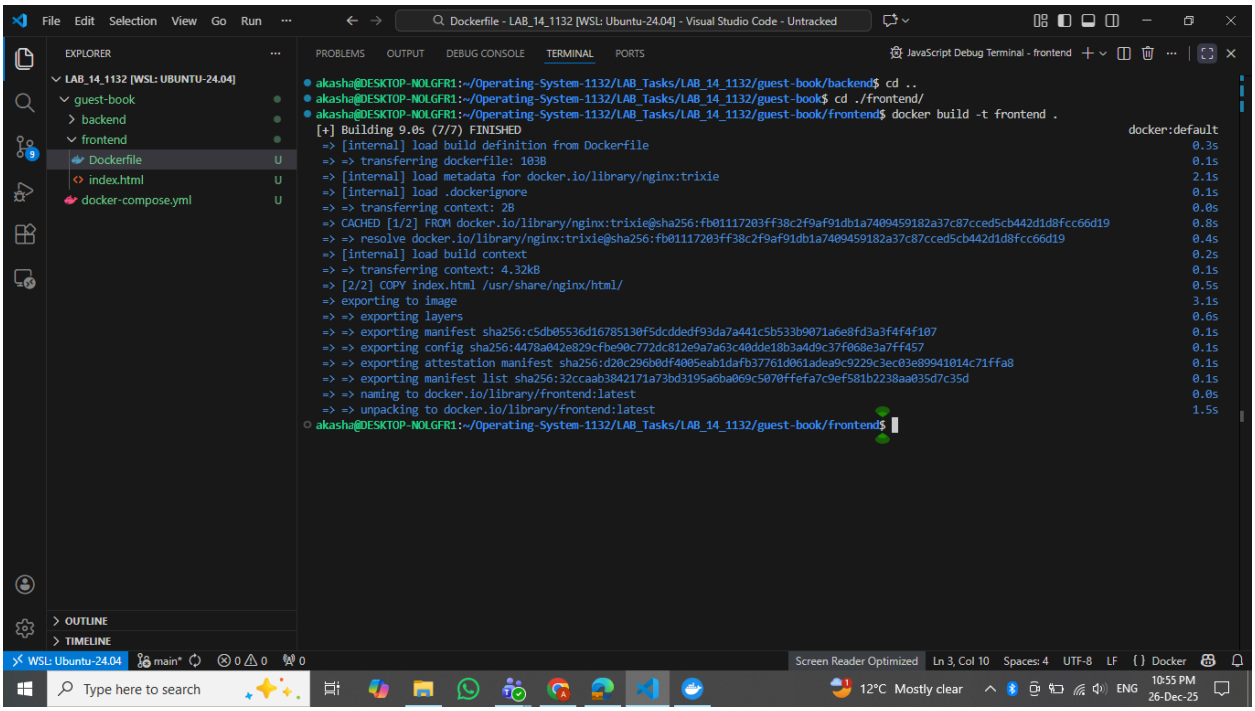
LAB_14

Task_01: Whole Project Structure:

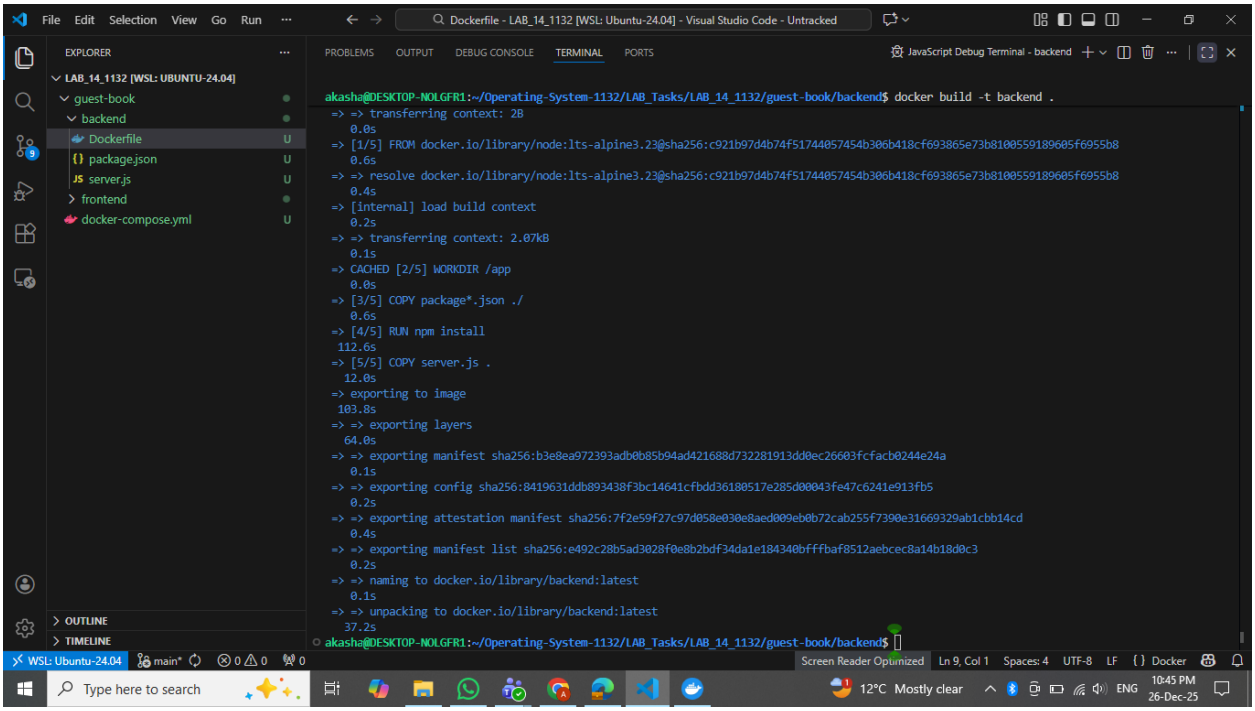


Task_02: Output of both image building commands e.g "docker build -t frontend ."

Docker build -t frontend .

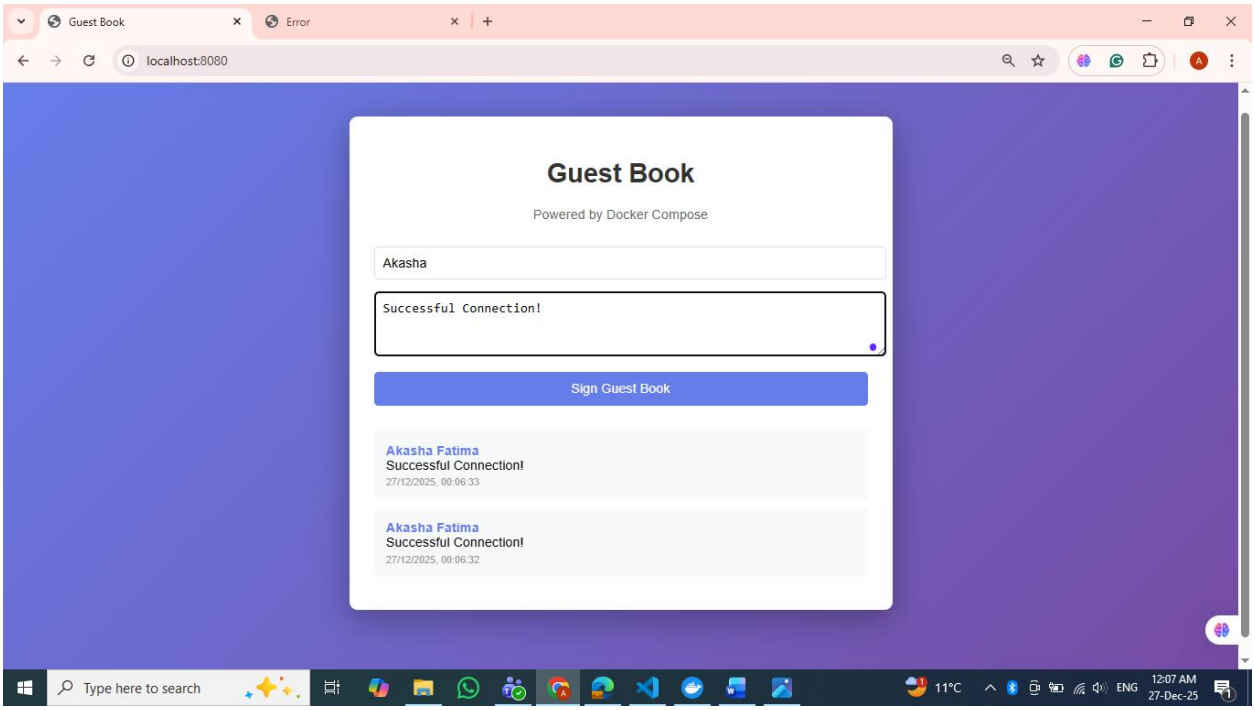


Docker build -t backend .

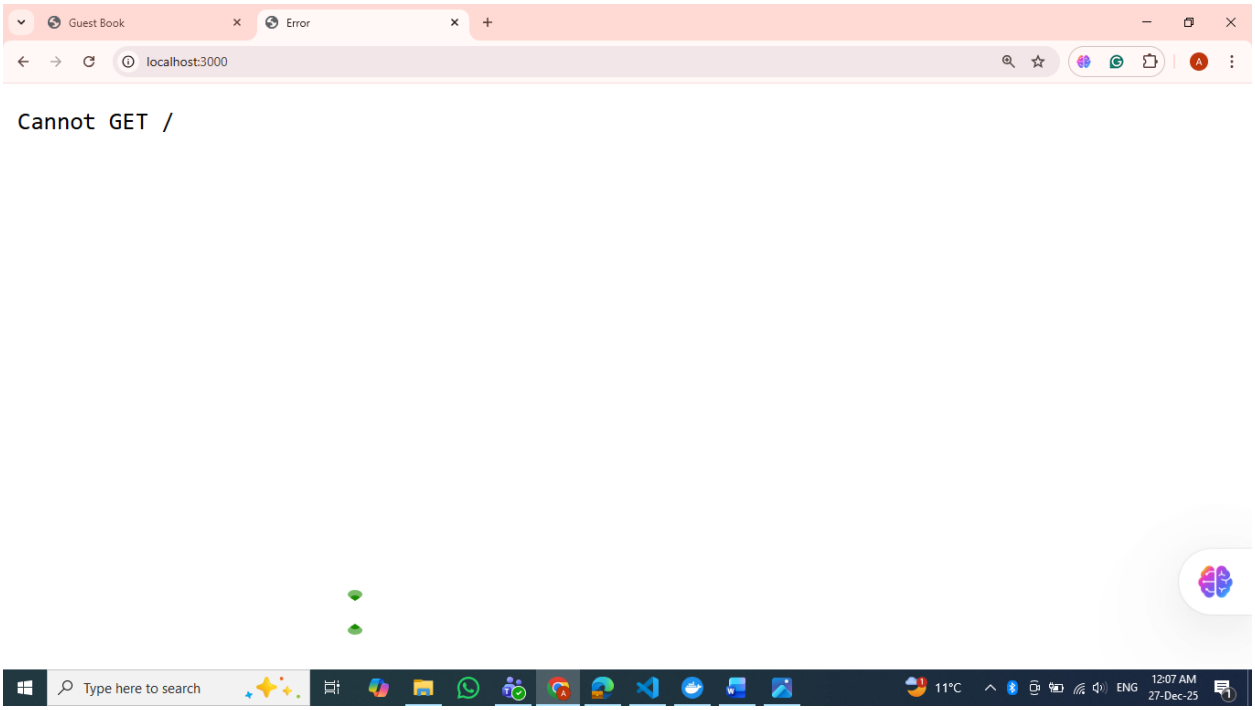


Task_03: Webpage at localhost:8080

localhost:8080



localhost:3000



Task_04: Copy contents of docker-compose and both Dockerfiles in the pdf.

Docker-compose.yml:

```
services:
  # MongoDB Database
  mongodb:
    image: mongo:7-jammy
    container_name: guestbook-db
    networks:
      - backend-network
    volumes:
      - mongo_data:/data/db

  # Backend API
  api:
    # build: ./backend
    image: backend
    container_name: guestbook-api
    environment:
      - MONGO_URL=mongodb://mongodb:27017
    ports:
```

```
    - "3000:3000"
  depends_on:
    - mongodb
  networks:
    - backend-network
    - frontend-network

 # Frontend
 web:
  # build: ./frontend
  image: frontend
  container_name: guestbook-web
  ports:
    - "8080:80"
  depends_on:
    - api
  networks:
    - frontend-network

networks:
 backend-network:
 frontend-network:

volumes:
 mongo_data:
```

frontend/Dockerfile

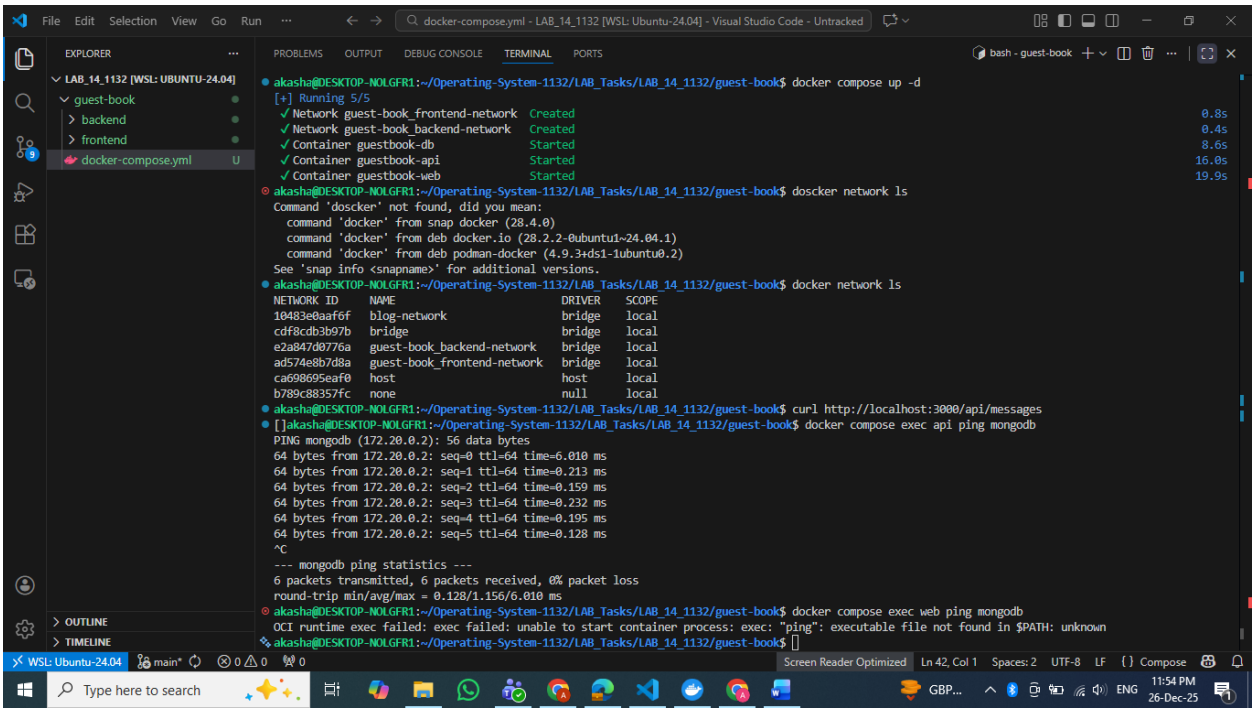
```
FROM nginx:trixie
COPY index.html /usr/share/nginx/html/
EXPOSE 80
```

backend/Dockerfile

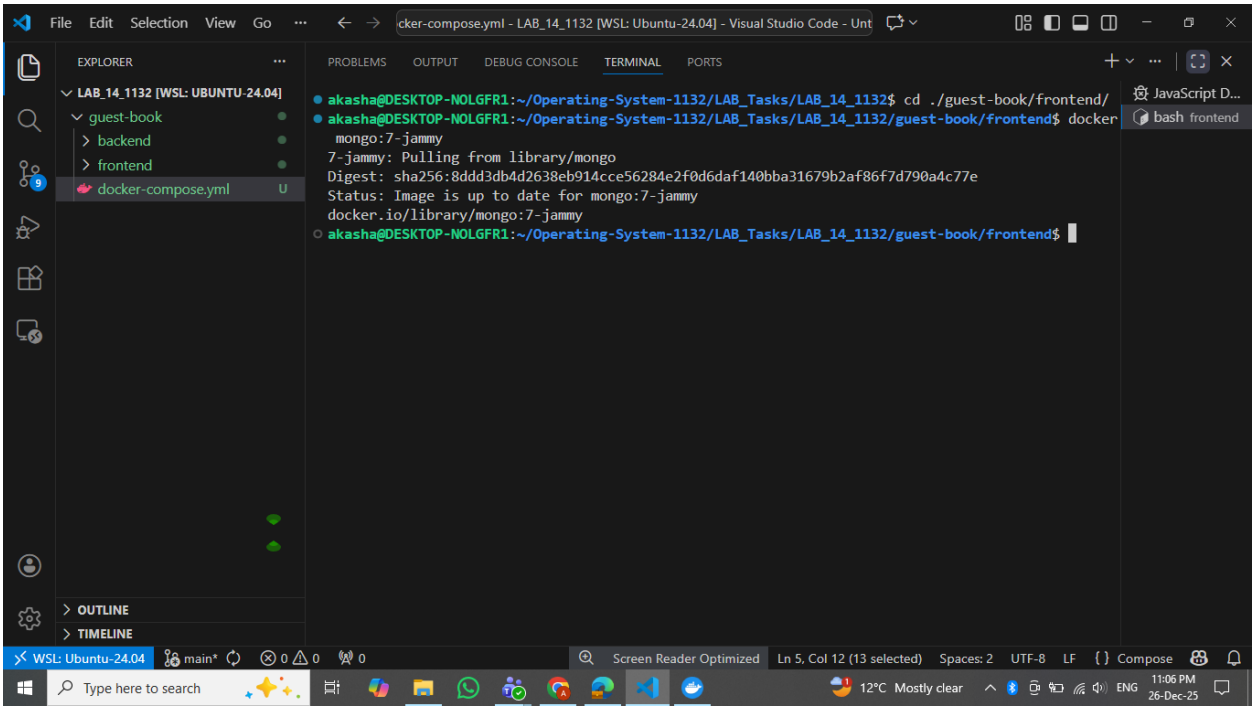
```
FROM node:lts-alpine3.23

WORKDIR /app
```

```
COPY package*.json ./

RUN npm install
COPY server.js .

EXPOSE 3000
CMD ["npm", "start"]
```

Task_05: Output of the instruction's verification:



Task_06: Additional Executions:


File Edit Selection View Go
cker-compose.yml - LAB_14_1132 [WSL: Ubuntu-24.04] - Visual Studio Code - Unt
EXPLORER
LAB_14_1132 [WSL: UBUNTU-24.04]
guest-book
backend
frontend
docker-compose.yml U
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
akasha@DESKTOP-NOLGFR1:~/Operating-System-1132/LAB_Tasks/LAB_14_1132$ cd ./guest-book/frontend/
akasha@DESKTOP-NOLGFR1:~/Operating-System-1132/LAB_Tasks/LAB_14_1132/guest-book/frontend$ docker
mongo:7-jammy
7-jammy: Pulling from library/mongo
Digest: sha256:8ddd3db4d2638eb914cce56284e2f0d6daf140bba31679b2af86f7d790a4c77e
Status: Image is up to date for mongo:7-jammy
docker.io/library/mongo:7-jammy
akasha@DESKTOP-NOLGFR1:~/Operating-System-1132/LAB_Tasks/LAB_14_1132/guest-book/frontend$
JavaScript D...
bash frontend
OUTLINE
TIMELINE
WSL: Ubuntu-24.04 main* 0 0 0
Screen Reader Optimized Ln 5, Col 12 (13 selected) Spaces: 2 UTF-8 LF { } Compose
Type here to search
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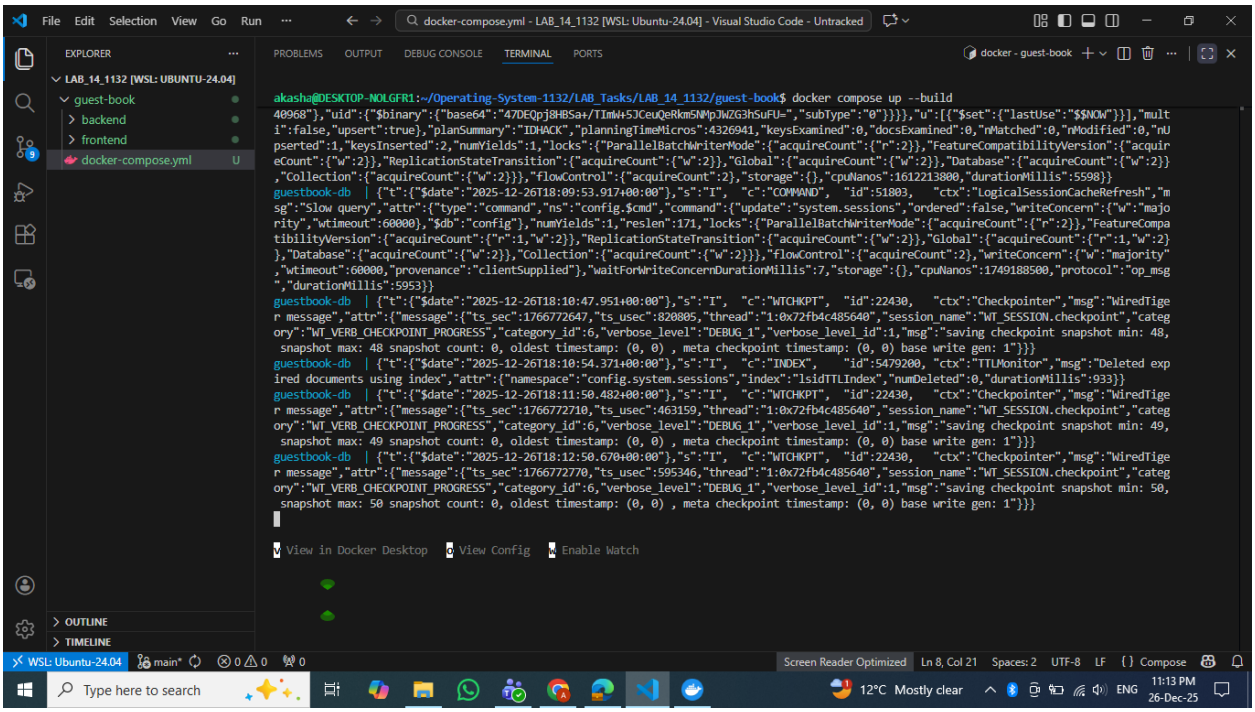
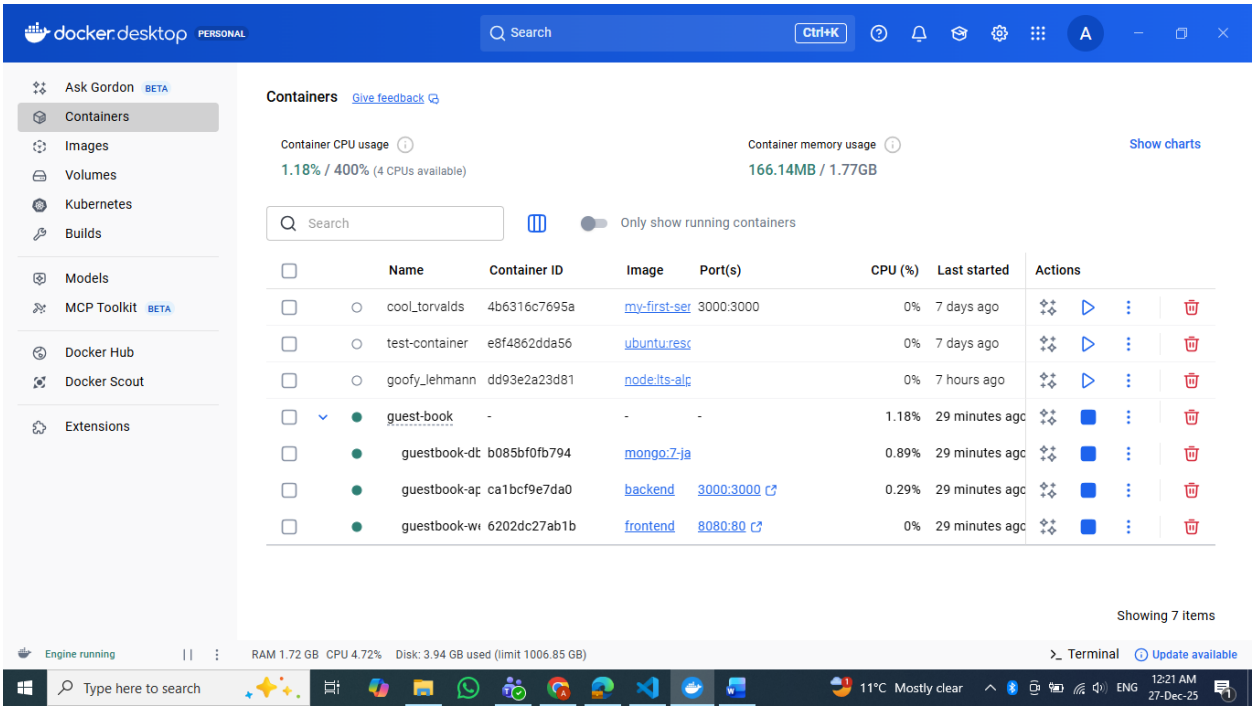
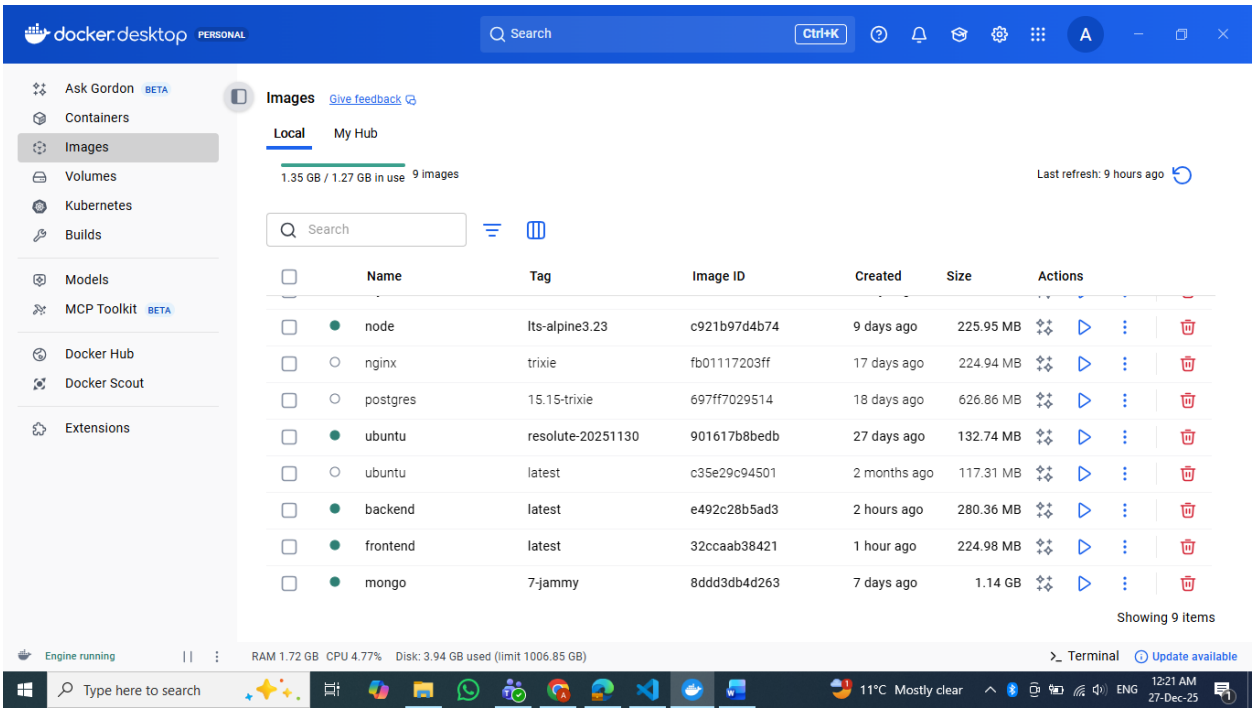
ENG 11:06 PM 26-Dec-25


File Edit Selection View Go Run
docker-compose.yml - LAB_14_1132 [WSL: Ubuntu-24.04] - Visual Studio Code - Untracked
EXPLORER
LAB_14_1132 [WSL: UBUNTU-24.04]
guest-book
backend
frontend
docker-compose.yml U
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
docker - guest-book
akasha@DESKTOP-NOLGFR1:~/Operating-System-1132/LAB_Tasks/LAB_14_1132/guest-book$ docker compose up --build
guestbook-db | {"t":{"$date":"2025-12-26T18:09:53.917+00:00"},"s":"I", "c":"COMMAND", "id":51803, "ctx":"LogicalSessionCacheRefresh","msg":"Slow query","attr":{"type":"command","ns":"config.$cmd","command":{"update":"system.sessions","ordered":false,"writeConcern":{"w":"majority","wtimeout":60000},"$db":"config"},"numYields":1,"reslen":171,"locks":{"ParallelBatchWriterMode":{"acquireCount":{"r":2}},"FeatureCompatibilityVersion":{"acquireCount":{"r":1,"w":2}},"ReplicationStateTransition":{"acquireCount":{"w":2}},"Global":{"acquireCount":{"r":1,"w":2}},"Database":{"acquireCount":{"w":2}},"Collection":{"acquireCount":{"w":2}},"flowControl":{"acquireCount":2},"writeConcern":{"w":"majority","wtimeout":60000,"provenance":"clientSupplied"},"waitForWriteConcernDurationMillis":7,"storage":{},"cpuNanos":1749188500,"protocol":"op_msg","durationMillis":5953}}
guestbook-db | {"t":{"$date":"2025-12-26T18:10:47.951+00:00"},"s":"I", "c":"WTCHKPT", "id":22430, "ctx":"Checkpointer","msg":"WiredTiger message","attr":{"message":{"ts_sec":1766772647,"ts_usec":820805,"thread":"1:0x72fb4c485640","session_name":"WT_SESSION.checkpoint","category":"WT_VERB_CHECKPOINT_PROGRESS","category_id":6,"verbose_level":"DEBUG_1","verbose_level_id":1,"msg":"saving checkpoint snapshot min: 48, snapshot max: 48 snapshot count: 0, oldest timestamp: (0, 0) , meta checkpoint timestamp: (0, 0) base write gen: 1"}}}
guestbook-db | {"t":{"$date":"2025-12-26T18:10:54.371+00:00"},"s":"I", "c":"INDEX", "id":5479200, "ctx":"TTLMonitor","msg":"Deleted expired documents using index","attr":{"namespace":"config.system.sessions","index":"lsidTTLIndex","numDeleted":0,"durationMillis":933}}
guestbook-db | {"t":{"$date":"2025-12-26T18:11:50.482+00:00"},"s":"I", "c":"WTCHKPT", "id":22430, "ctx":"Checkpointer","msg":"WiredTiger message","attr":{"message":{"ts_sec":1766772710,"ts_usec":463159,"thread":"1:0x72fb4c485640","session_name":"WT_SESSION.checkpoint","category":"WT_VERB_CHECKPOINT_PROGRESS","category_id":6,"verbose_level":"DEBUG_1","verbose_level_id":1,"msg":"saving checkpoint snapshot min: 49, snapshot max: 49 snapshot count: 0, oldest timestamp: (0, 0) , meta checkpoint timestamp: (0, 0) base write gen: 1"}}}
guestbook-db | {"t":{"$date":"2025-12-26T18:12:50.670+00:00"},"s":"I", "c":"WTCHKPT", "id":22430, "ctx":"Checkpointer","msg":"WiredTiger message","attr":{"message":{"ts_sec":1766772770,"ts_usec":595346,"thread":"1:0x72fb4c485640","session_name":"WT_SESSION.checkpoint","category":"WT_VERB_CHECKPOINT_PROGRESS","category_id":6,"verbose_level":"DEBUG_1","verbose_level_id":1,"msg":"saving checkpoint snapshot min: 50, snapshot max: 50 snapshot count: 0, oldest timestamp: (0, 0) , meta checkpoint timestamp: (0, 0) base write gen: 1"}}}
View in Docker Desktop
View Config
Enable Watch
OUTLINE
TIMELINE
WSL: Ubuntu-24.04 main* 0 0 0
Screen Reader Optimized Ln 8, Col 21 Spaces: 2 UTF-8 LF { } Compose
Type here to search
12°C Mostly clear
ENG 11:13 PM 26-Dec-25


docker desktop PERSONAL
Search Ctrl+K
Ask Gordon BETA
Containers
Images
Volumes
Kubernetes
Builds
Models
MCP Toolkit BETA
Docker Hub
Docker Scout
Extensions
Containers Give feedback
Container CPU usage
1.18% / 400% (4 CPUs available)
Container memory usage
166.14MB / 1.77GB
Show charts
Search
Only show running containers
Name Container ID Image Port(s) CPU (%) Last started Actions
cool_torvalds 4b6316c7695a my-first-ser 3000:3000 0% 7 days ago
test-container e8f4862dda56 ubuntu:resc 0% 7 days ago
goofy_lehmann dd93e2a23d81 node:lts-alp 0% 7 hours ago
guest-book - - - 1.18% 29 minutes ago
guestbook-db b085bf0fb794 mongo:7-ja 0.89% 29 minutes ago
guestbook-ap ca1bcf9e7da0 backend 3000:3000 0.29% 29 minutes ago
guestbook-we 6202dc27ab1b frontend 8080:80 0% 29 minutes ago
Showing 7 items
Engine running
RAM 1.72 GB CPU 4.72% Disk: 3.94 GB used (limit 1006.85 GB)
Terminal
Update available
Type here to search
11°C Mostly clear
ENG
12:21 AM
27-Dec-25


docker desktop PERSONAL
Search Ctrl+K
Ask Gordon BETA
Containers
Images
Volumes
Kubernetes
Builds
Models
MCP Toolkit BETA
Docker Hub
Docker Scout
Extensions
Images Give feedback
Local My Hub
1.35 GB / 1.27 GB in use 9 images
Last refresh: 9 hours ago
Search
Name Tag Image ID Created Size Actions
node lts-alpine3.23 c921b97d4b74 9 days ago 225.95 MB
nginx trixie fb01117203ff 17 days ago 224.94 MB
postgres 15.15-trixie 697ff7029514 18 days ago 626.86 MB
ubuntu resolute-20251130 901617b8bedb 27 days ago 132.74 MB
ubuntu latest c35e29c94501 2 months ago 117.31 MB
backend latest e492c28b5ad3 2 hours ago 280.36 MB
frontend latest 32ccaab38421 1 hour ago 224.98 MB
mongo 7-jammy 8ddd3db4d263 7 days ago 1.14 GB
Showing 9 items
Engine running
RAM 1.72 GB CPU 4.77% Disk: 3.94 GB used (limit 1006.85 GB)
Terminal
Update available
Type here to search
11°C Mostly clear
ENG
12:21 AM
27-Dec-25