



National Textile University

Department of Computer Science

Subject:

Operating System

Submitted To:

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Submitted By:

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Registration No:

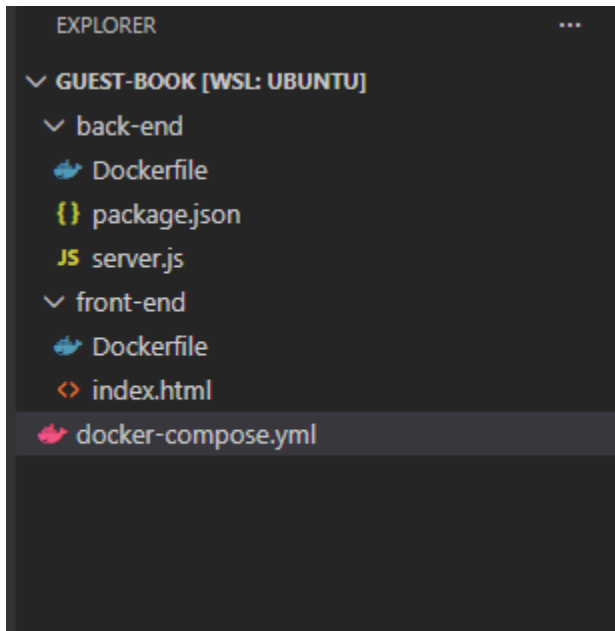
23-NTU-CS-1221

Assignment:

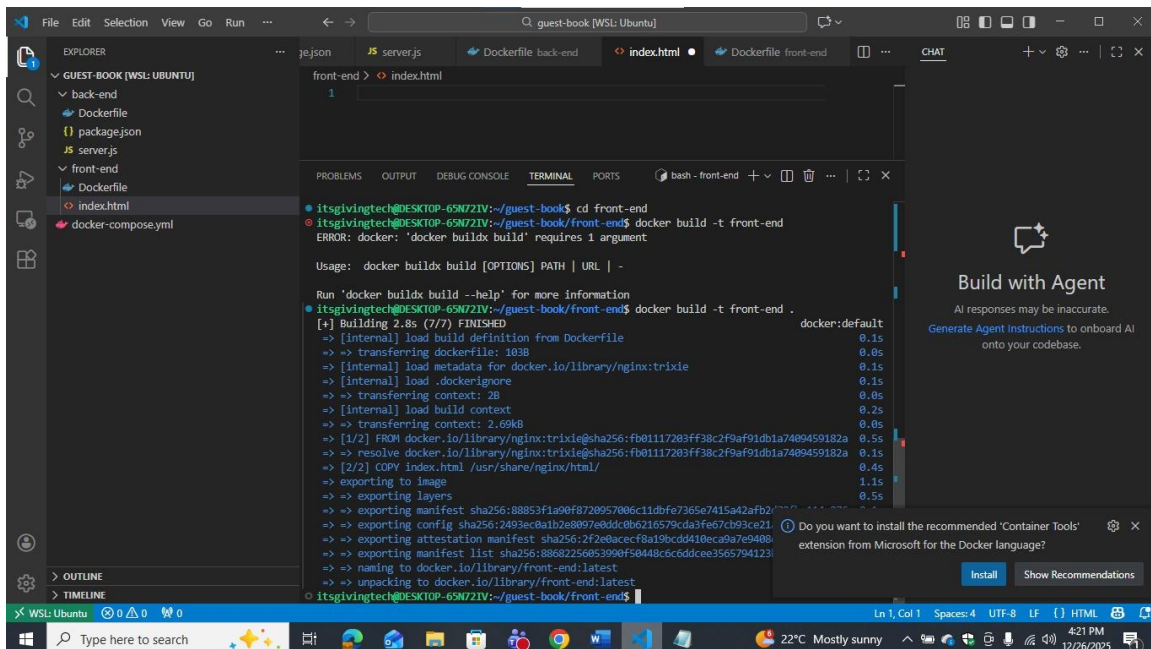
Docker home task

Semester:

Directory structure:



Front-end Image creation:



Back-end image creation:

```
itsgivingtech@DESKTOP-65N72IV:~/guest-book$ cd back-end
itsgivingtech@DESKTOP-65N72IV:~/guest-book/back-end$ docker build -t back-end .
[+] Building 3.6s (10/10) FINISHED                                docker:default
=> [internal] load build definition from Dockerfile              0.1s
=> => transferring dockerfile: 189B                               0.0s
=> [internal] load metadata for docker.io/library/node:lts-alpine3.23 0.4s
=> [internal] load .dockerignore                                  0.1s
=> => transferring context: 2B                                     0.0s
=> [stage-1 1/5] FROM docker.io/library/node:lts-alpine3.23@sha256:c921b97d4b74f517 0.3s
=> => resolve docker.io/library/node:lts-alpine3.23@sha256:c921b97d4b74f51744057454 0.2s
=> [internal] load build context                                  0.1s
=> => transferring context: 63B                                    0.0s
=> CACHED [stage-1 2/5] WORKDIR /app                             0.0s
=> CACHED [stage-1 3/5] COPY package*.json ./                   0.0s
=> CACHED [stage-1 4/5] RUN npm install                          0.0s
=> CACHED [stage-1 5/5] COPY server.js .                         0.0s
=> exporting to image                                           1.1s
=> => exporting layers                                           0.1s
=> => exporting manifest sha256:0ce08577f55ac90a053f0e00c3f74a68d12297929722c1d1a7f 0.2s
=> => exporting config sha256:dbfd8c5b72304ea7e47d7b097eb91b5794752ef7c261e62ea7568 0.2s
=> => exporting attestation manifest sha256:329cd3710cf7b02283fbc72b252377130f16d2e 0.1s
=> => exporting manifest list sha256:4bdc6ce165ea6b48c1708e03b21168471bf4b0197b33fa 0.1s
=> => naming to docker.io/library/back-end:latest               0.0s
=> => unpacking to docker.io/library/back-end:latest            0.1s
itsgivingtech@DESKTOP-65N72IV:~/guest-book/back-end$
```

Compose command:

```

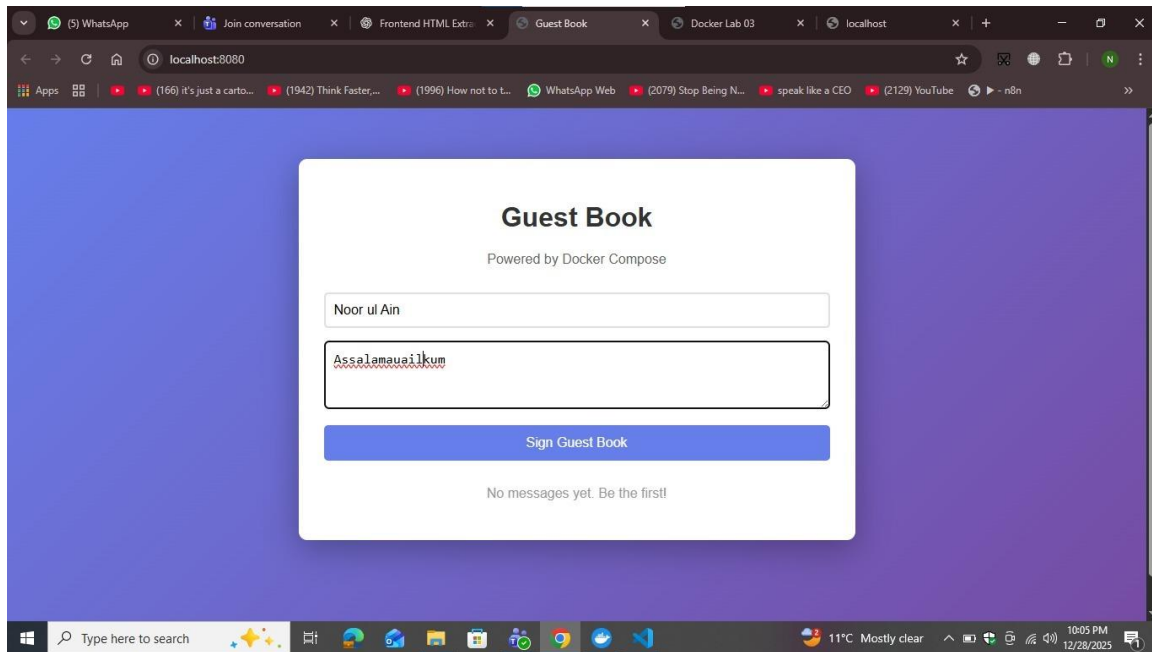
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL ...
docker - guest-book + v [] [X] ... | [X] [X] [X]
itsgivingtech@DESKTOP-65N72IV:~/guest-book$ docker compose up --build
=> => reading from stdin 961B 0.0s
unable to prepare context: path "/home/itsgivingtech/guest-book/backend" not found

itsgivingtech@DESKTOP-65N72IV:~/guest-book$ docker compose up --build
[+] Building 6.0s (20/20) FINISHED
=> [internal] load local bake definitions 0.0s
=> => reading from stdin 965B 0.0s
=> [web internal] load build definition from Dockerfile 0.5s
=> => transferring dockerfile: 103B 0.2s
=> [api internal] load build definition from Dockerfile 0.5s
=> => transferring dockerfile: 162B 0.2s
=> [web internal] load metadata for docker.io/library/nginx:trixie 0.5s
=> [api internal] load metadata for docker.io/library/node:lts-alpine3.23 0.5s
=> [web internal] load .dockerignore 0.2s
=> => transferring context: 2B 0.0s
=> [api internal] load .dockerignore 0.1s
=> => transferring context: 2B 0.0s
=> CACHED [web 1/2] FROM docker.io/library/nginx:trixie@sha256:fb01117203ff38c2f9af91db1a 0.4s
=> => resolve docker.io/library/nginx:trixie@sha256:fb01117203ff38c2f9af91db1a7409459182a 0.3s
=> [web internal] load build context 0.2s
=> => transferring context: 3.01kB 0.0s
=> [api 1/5] FROM docker.io/library/node:lts-alpine3.23@sha256:c921b97d4b74f51744057454b3 0.4s
=> => resolve docker.io/library/node:lts-alpine3.23@sha256:c921b97d4b74f51744057454b306b4 0.3s
=> [api internal] load build context 0.2s
=> => transferring context: 1.86kB 0.1s
=> CACHED [api 2/5] WORKDIR /app 0.0s
=> CACHED [api 3/5] COPY package*.json ./ 0.0s
=> CACHED [api 4/5] RUN npm install 0.1s
=> [web 2/2] COPY index.html /usr/share/nginx/html/ 0.5s
=> [api 5/5] COPY server.js . 0.4s
=> [web] exporting to image 2.6s
=> => exporting layers 1.1s

```

```
[+] Running 7/7
✓ guest-book-web Built 0.0s
✓ guest-book-api Built 0.0s
✓ Network guest-book_guestbook-network Created 0.9s
✓ Volume guest-book_mongo_data Created 0.2s
✓ Container guestbook-db Created 0.8s
✓ Container guestbook-api Created 0.8s
✓ Container guestbook-web Created 1.1s
Attaching to guestbook-api, guestbook-db, guestbook-web
guestbook-db | {"t":{"$date":"2025-12-28T17:04:03.065+00:00"},"s":"I", "c":"NETWORK", "id":491
5701, "ctx":"main", "msg":"Initialized wire specification", "attr":{"spec":{"incomingExternalClient
":{"minWireVersion":0,"maxWireVersion":21},"incomingInternalClient":{"minWireVersion":0,"maxWireV
ersion":21},"outgoing":{"minWireVersion":6,"maxWireVersion":21},"isInternalClient":true}}}
guestbook-db | {"t":{"$date":"2025-12-28T17:04:03.067+00:00"},"s":"I", "c":"CONTROL", "id":232
85, "ctx":"main", "msg":"Automatically disabling TLS 1.0, to force-enable TLS 1.0 specify --sslD
isableProtocols 'none'"}
guestbook-db | {"t":{"$date":"2025-12-28T17:04:03.086+00:00"},"s":"I", "c":"NETWORK", "id":464
8601, "ctx":"main", "msg":"Implicit TCP FastOpen unavailable. If TCP FastOpen is required, set tcp
FastOpenServer, tcpFastOpenClient, and tcpFastOpenQueueSize."}
guestbook-db | {"t":{"$date":"2025-12-28T17:04:03.090+00:00"},"s":"I", "c":"REPL", "id":512
3008, "ctx":"main", "msg":"Successfully registered PrimaryOnlyService", "attr":{"service":"TenantMi
grationDonorService","namespace":"config.tenantMigrationDonors"}}
guestbook-db | {"t":{"$date":"2025-12-28T17:04:03.091+00:00"},"s":"I", "c":"REPL", "id":512
3008, "ctx":"main", "msg":"Successfully registered PrimaryOnlyService", "attr":{"service":"TenantMi
```

Web page:



Test API directly:

Curl command:

“curl http://localhost:3000/api/messages”

```
Select Command Prompt
Microsoft Windows [Version 10.0.19045.6456]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Hp>curl http://localhost:3000/api/messages
[]
C:\Users\Hp>curl http://localhost:3000/api/messages
[{"_id":"695163a4c83ca48becb46780","name":"Noor ul Ain","message":"Assalamualaikum","timestamp":"2025-12-28T10:05:00.000Z","__v":0}]
```

Enter API container and ping MongoDB(working):

“docker compose exec api ping mongodb”

```
itsgivingtech@DESKTOP-65N72IV: ~/guest-book
PING mongodb (172.19.0.2): 56 data bytes
64 bytes from 172.19.0.2: seq=0 ttl=64 time=4.944 ms

--- mongodb ping statistics ---
1 packets transmitted, 1 packets received, 0% packet loss
round-trip min/avg/max = 4.944/4.944/4.944 ms
/app # docker compose exec api ping mongodb
sh: docker: not found
/app # exit
itsgivingtech@DESKTOP-65N72IV:~/guest-book$ docker compose exec api ping mongodb
PING mongodb (172.19.0.2): 56 data bytes
64 bytes from 172.19.0.2: seq=0 ttl=64 time=0.253 ms

64 bytes from 172.19.0.2: seq=1 ttl=64 time=0.311 ms
64 bytes from 172.19.0.2: seq=2 ttl=64 time=0.267 ms
64 bytes from 172.19.0.2: seq=3 ttl=64 time=0.303 ms
64 bytes from 172.19.0.2: seq=4 ttl=64 time=0.352 ms
64 bytes from 172.19.0.2: seq=5 ttl=64 time=0.354 ms
64 bytes from 172.19.0.2: seq=6 ttl=64 time=0.801 ms
64 bytes from 172.19.0.2: seq=7 ttl=64 time=0.192 ms
64 bytes from 172.19.0.2: seq=8 ttl=64 time=0.213 ms
64 bytes from 172.19.0.2: seq=9 ttl=64 time=0.313 ms
64 bytes from 172.19.0.2: seq=10 ttl=64 time=0.355 ms
64 bytes from 172.19.0.2: seq=11 ttl=64 time=0.363 ms
64 bytes from 172.19.0.2: seq=12 ttl=64 time=0.628 ms
64 bytes from 172.19.0.2: seq=13 ttl=64 time=0.361 ms
64 bytes from 172.19.0.2: seq=14 ttl=64 time=0.496 ms
64 bytes from 172.19.0.2: seq=15 ttl=64 time=0.345 ms
64 bytes from 172.19.0.2: seq=16 ttl=64 time=0.481 ms
64 bytes from 172.19.0.2: seq=17 ttl=64 time=0.423 ms
64 bytes from 172.19.0.2: seq=18 ttl=64 time=0.152 ms
64 bytes from 172.19.0.2: seq=19 ttl=64 time=0.144 ms
64 bytes from 172.19.0.2: seq=20 ttl=64 time=0.178 ms
64 bytes from 172.19.0.2: seq=21 ttl=64 time=0.183 ms
64 bytes from 172.19.0.2: seq=22 ttl=64 time=0.463 ms
64 bytes from 172.19.0.2: seq=23 ttl=64 time=0.575 ms
64 bytes from 172.19.0.2: seq=24 ttl=64 time=0.301 ms
64 bytes from 172.19.0.2: seq=25 ttl=64 time=0.647 ms
64 bytes from 172.19.0.2: seq=26 ttl=64 time=0.858 ms
64 bytes from 172.19.0.2: seq=27 ttl=64 time=0.309 ms
64 bytes from 172.19.0.2: seq=28 ttl=64 time=0.189 ms
64 bytes from 172.19.0.2: seq=29 ttl=64 time=2.400 ms
64 bytes from 172.19.0.2: seq=30 ttl=64 time=0.518 ms
64 bytes from 172.19.0.2: seq=31 ttl=64 time=0.349 ms
```

Try from web container :

“docker compose exec web ping mongodb” (Failed)

```
itsgivingtech@DESKTOP-65N72IV: ~/guest-book
itsgivingtech@DESKTOP-65N72IV:~/guest-book$ docker compose exec web ping mongodb
OCI runtime exec failed: exec failed: unable to start container process: exec: "ping": executable file
not found in $PATH
itsgivingtech@DESKTOP-65N72IV:~/guest-book$
```

Code part:

Back-end/Docker file:

```
FROM node:lts-alpine3.23
FROM node:lts-alpine3.23
WORKDIR /app
COPY package*.json ./
RUN npm install
COPY server.js .
EXPOSE 3000
CMD ["npm", "start"]
```

Front-end/Docker file:

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

Docker-compose.yml:

```
services:

  mongodb:
    image: mongo:7-jammy
    container_name: guestbook-db
    networks:
      - guestbook-network
    volumes:
      - mongo_data:/data/db

  api:
    build: ./back-end
    container_name: guestbook-api
    environment:
      - MONGO_URL=mongodb://mongodb:27017/guestbook
    ports:
      - "3000:3000"
    depends_on:
      - mongodb
    networks:
```

```
    - guestbook-network

web:
  build: ./front-end
  container_name: guestbook-web
  ports:
    - "8080:80"
  depends_on:
    - api
  networks:
    - guestbook-network

networks:
  guestbook-network:

volumes:
  mongo_data:
```