National Textile University

Department of Computer Science

Subject:

Operating System

Submitted To:

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Submitted By:

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Registration No:
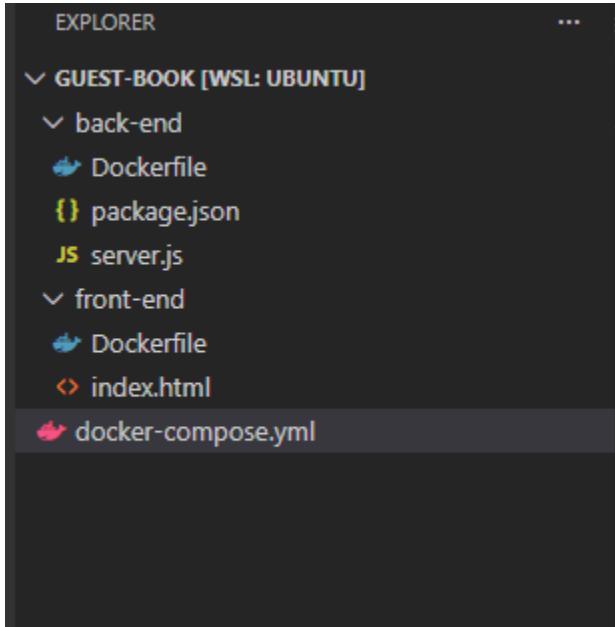
23-NTU-CS-1221

Assignment:

Docker home task

Semester:

5

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:
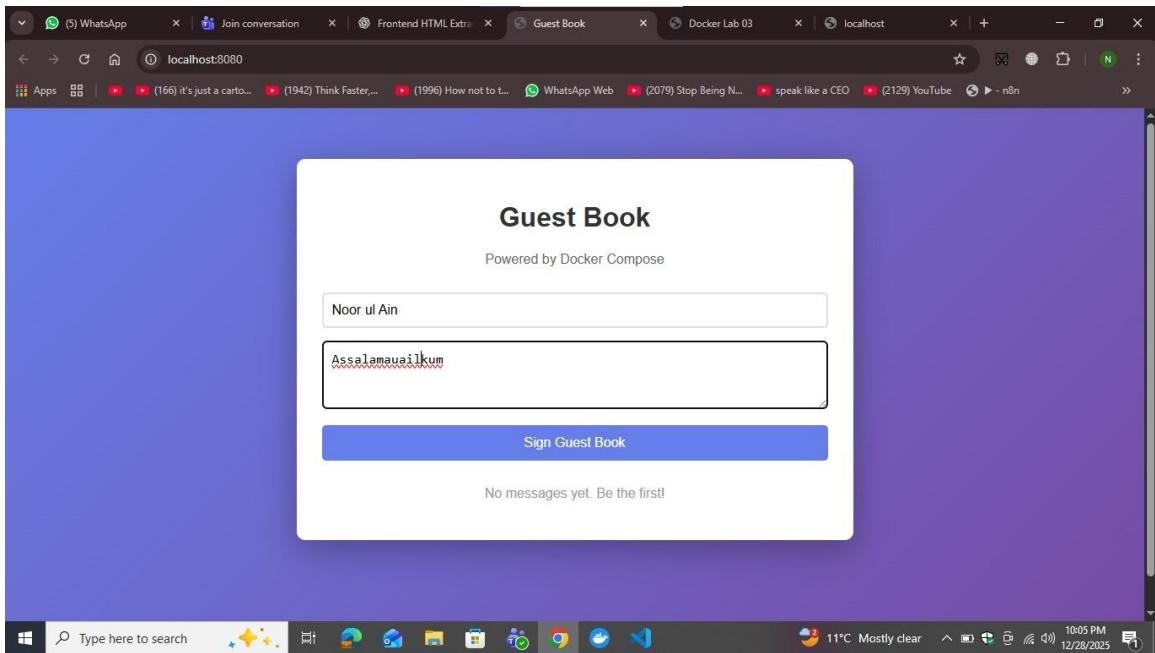
```
itsgivingtech@DESKTOP-65N72IV:~/guest-book$ docker compose up --build
 => => reading from stdin 961B                                                   0.0s
unable to prepare context: path "/home/itsgivingtech/guest-book/backend" not found

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
isabledProtocols '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:
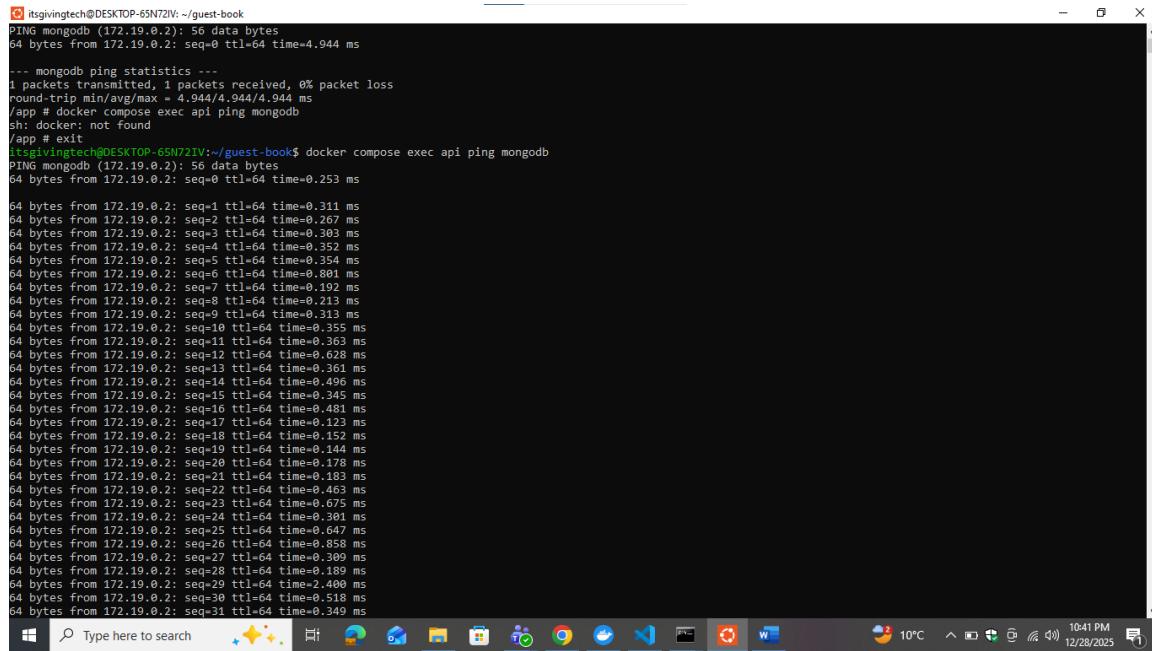
"curl http://localhost:3000/api/messages"

Enter API container and ping MongoDB(working):
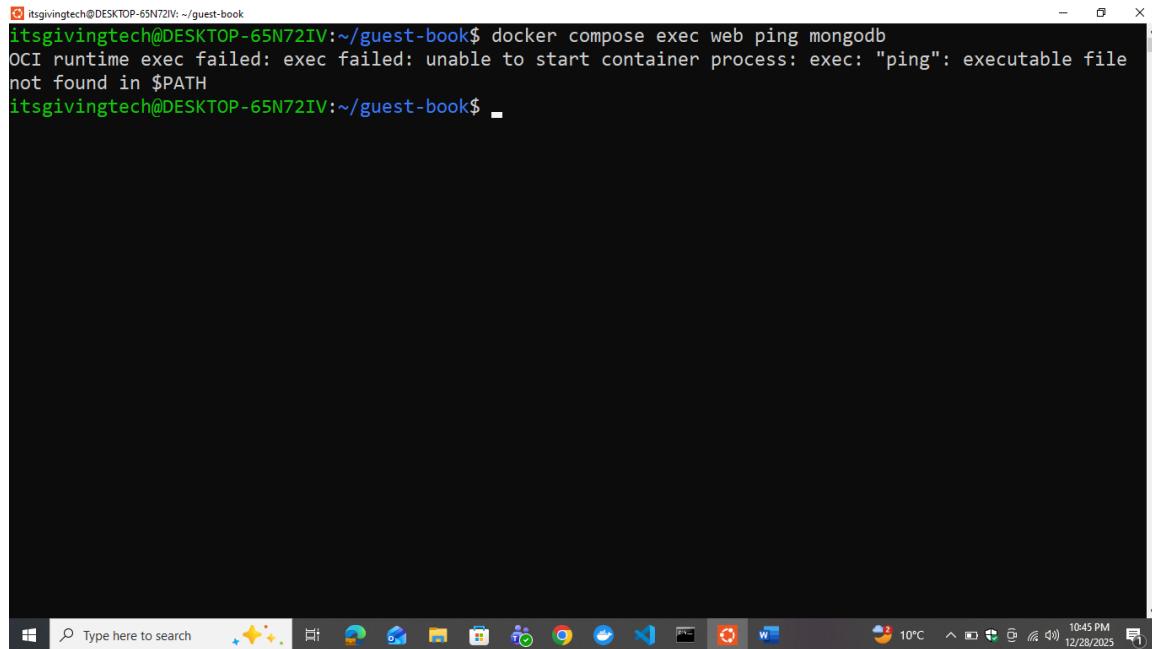
"docker compose exec api ping mongodb"

Try from web container :

"docker compose exec web ping mongodb" (Failed)

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:
```

```yaml
      - 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:
```