



National Textile University

Department of Computer Science

Subject:

Operating System

Submitted To:

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Submitted By:

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Registration No:

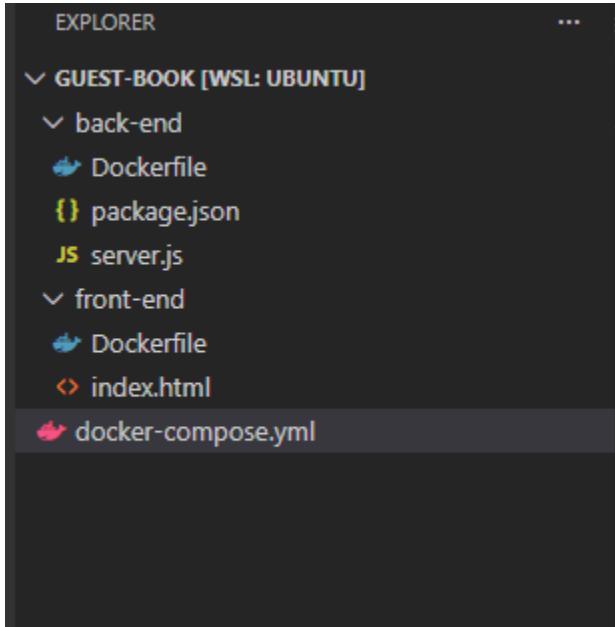
23-NTU-CS-1221

Assignment:

Docker home task

Semester:

Directory structure:



Front-end Image creation:

```
itsgivingtech@DESKTOP-69N72IV:~/guest-book$ cd front-end
itsgivingtech@DESKTOP-69N72IV:~/guest-book/front-end$ docker build -t front-end
ERROR: docker: 'docker buildx build' requires 1 argument

Usage: docker buildx build [OPTIONS] PATH | URL | -
Run 'docker buildx build --help' for more information
itsgivingtech@DESKTOP-69N72IV:~/guest-book/front-end$ docker build -t front-end .
[+] Building 2.8s (7/7) FINISHED
   => [internal] load build definition from Dockerfile
   => => transferring dockerfile: 103B
   => [internal] load metadata for docker.io/library/nginx:trixie
   => [internal] load .dockerignore
   => => transferring context: 2B
   => [internal] load build context
   => => transferring context: 2.69kB
   => [1/2] FROM docker.io/library/nginx:trixie@sha256:fb01117283ff38c2f9af91db1a7409459182a
   => => resolve docker.io/library/nginx:trixie@sha256:fb01117283ff38c2f9af91db1a7409459182a
   => [2/2] COPY index.html /usr/share/nginx/html/
   => exporting to image
   => exporting layers
   => => exporting manifest sha256:88855f199ef8720957086c11dfe7365e7415a42afb2
   => => exporting config sha256:2493ceca0a2e8897e0eddb0b216579da3fe67cb93ce21
   => => exporting attestation manifest sha256:2f2eb6acecf8a19ccdd410ecaa97e95408
   => => exporting manifest list sha256:8888225653990f54448ccceddee3565794123
   => => naming to docker.io/library/front-end:latest
   => => unpacking to docker.io/library/front-end:latest
itsgivingtech@DESKTOP-69N72IV:~/guest-book/front-end$
```

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:

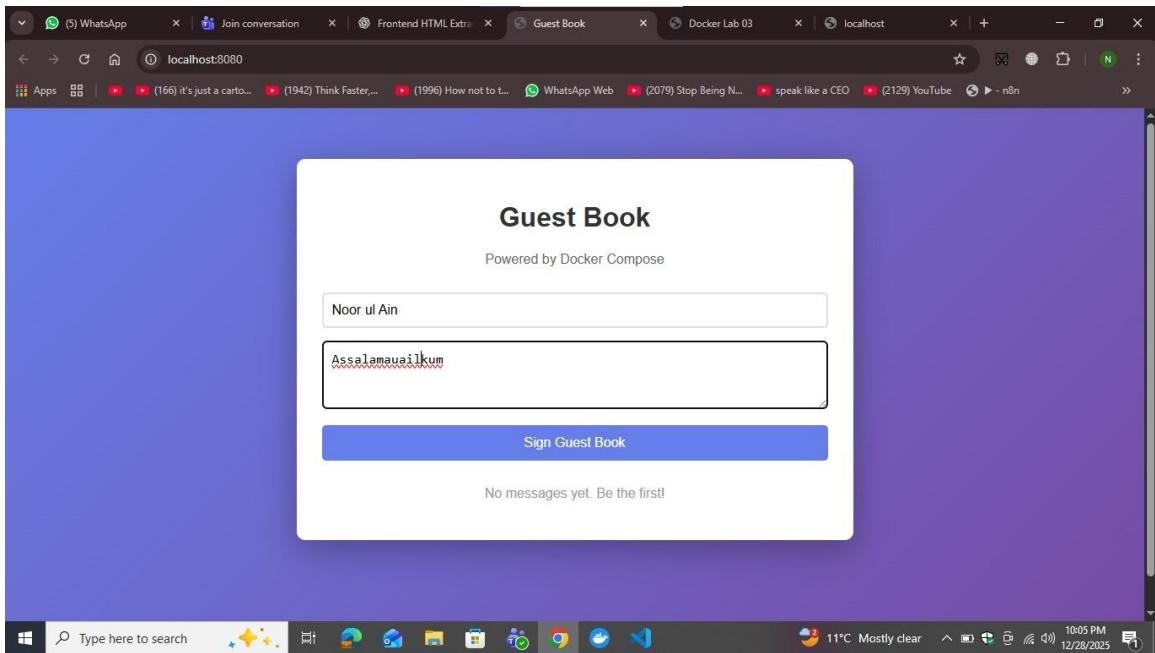
```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL    ...
itsgivingtech@DESKTOP-65N72IV:~/guest-book$ docker compose up --build
=> => reading from stdin 961B                               0.0s
unable to prepare context: path "/home/itsgivingtech/guest-book/backend" not found

❖ 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 .dockerrc                         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": {"$date": "2025-12-28T17:04:03.065+00:00"}, "s": "I", "c": "NETWORK", "id": 4915701, "ctx": "main", "msg": "Initialized wire specification", "attr": {"spec": {"incomingExternalClient": {"minWireVersion": 0, "maxWireVersion": 21}, "incomingInternalClient": {"minWireVersion": 0, "maxWireVersion": 21}, "outgoing": {"minWireVersion": 6, "maxWireVersion": 21, "isInternalClient": true}}}
guestbook-db | {"t": {"$date": "2025-12-28T17:04:03.067+00:00"}, "s": "I", "c": "CONTROL", "id": 23285, "ctx": "main", "msg": "Automatically disabling TLS 1.0, to force-enable TLS 1.0 specify --sslDIsableProtocols 'none'"}
guestbook-db | {"t": {"$date": "2025-12-28T17:04:03.086+00:00"}, "s": "I", "c": "NETWORK", "id": 4918601, "ctx": "main", "msg": "Implicit TCP FastOpen unavailable. If TCP FastOpen is required, set tcpFastOpenServer, tcpFastOpenClient, and tcpFastOpenQueueSize."}
guestbook-db | {"t": {"$date": "2025-12-28T17:04:03.090+00:00"}, "s": "I", "c": "REPL", "id": 5123008, "ctx": "main", "msg": "Successfully registered PrimaryOnlyService", "attr": {"service": "TenantMigrationDonorService", "namespace": "config.tenantMigrationDonors"}}
guestbook-db | {"t": {"$date": "2025-12-28T17:04:03.091+00:00"}, "s": "I", "c": "REPL", "id": 5123008, "ctx": "main", "msg": "Successfully registered PrimaryOnlyService", "attr": {"service": "TenantMi
```

Web page:



Test API directly:

Curl command:

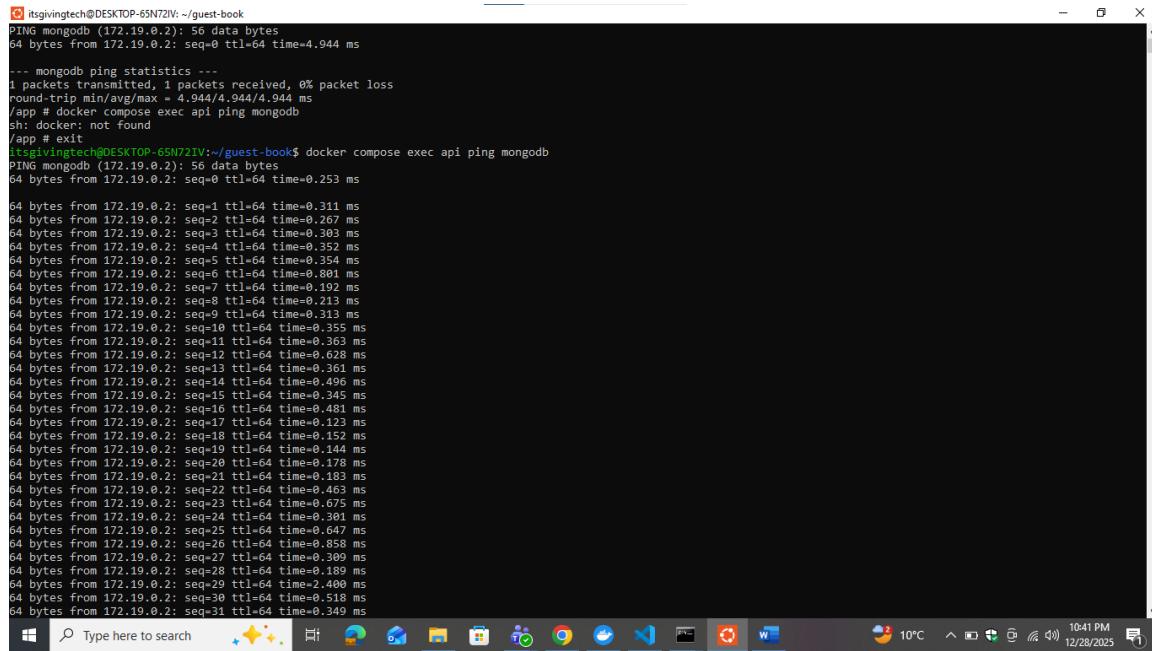
"curl http://localhost:3000/api/messages"

```
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": "2025-12-28T10:05:00Z", "__v": 0}]
```

Enter API container and ping MongoDB(working):

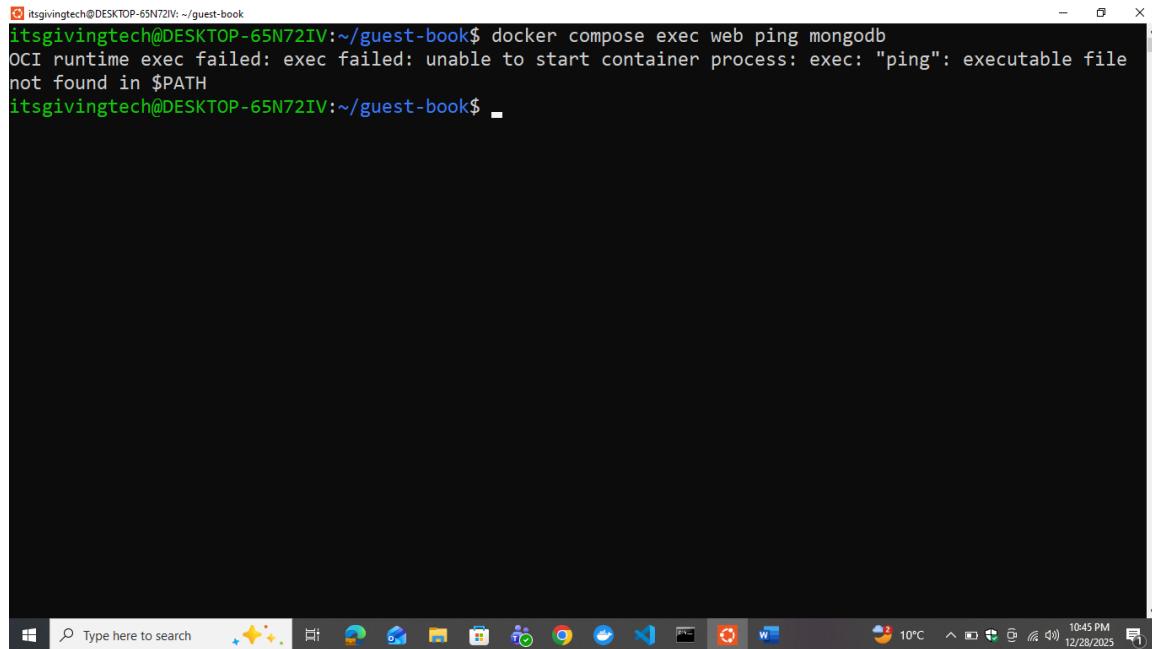
"docker compose exec api ping mongodb"



```
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
--- mongod 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=0.341 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=0.881 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=0.123 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=0.675 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=0.305 ms
64 bytes from 172.19.0.2: seq=28 ttl=64 time=0.805 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$ 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:
```