



# NationalTextile University

## DepartmentofComputerScience

Subject:  
Operating System

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Submittedto:  
**Sir Nasir Mahmood**

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Submittedby:

**Hussain Naweед**

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Reg number:

23-NTU-CS-1165

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Lab no. :

14<sup>th</sup>  
Docker Home task

Whole project structure:

The screenshot shows a terminal window with a dark theme. On the left, a file tree is displayed for a project named 'Lab12/guest-book'. The tree includes a 'backend' directory containing a 'Dockerfile', 'package.json', and 'server.js' file. It also includes a 'frontend' directory containing a 'dockerfile', 'index.html', and 'docker-compose.yml' file. At the bottom of the terminal, there are navigation buttons for 'OUTLINE' and 'TIMELINE', and a status bar showing 'Ubuntu' and various system icons.

```
Lab12/guest-book
└── backend
    ├── Dockerfile
    ├── package.json
    └── server.js
└── frontend
    ├── dockerfile
    ├── index.html
    └── docker-compose.yml
```

=> CACHED [1/5] FROM  
=> => resolve docker  
=> [internal] load b  
=> => transferring D  
=> [2/5] WORKDIR /ap  
=> [3/5] COPY packag  
=> [4/5] RUN npm ins  
=> [5/5] COPY server  
=> exporting to imag  
=> => exporting laye  
=> => exporting conf  
=> => exporting atte  
=> => exporting atte  
=> => exporting to i  
=> => exporting to d  
=> => unpacking to d

● HussainNaweed@Hussain-pc ~

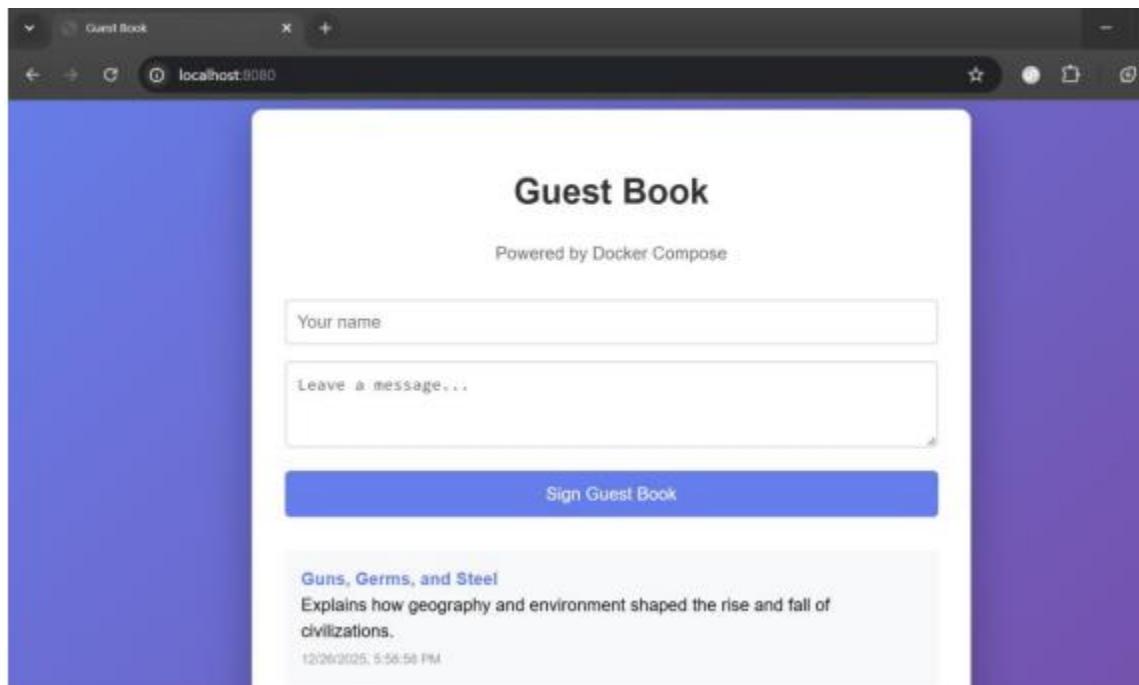
Backend image creation:

```
HussainNaweed@Hussain-pc:~/OperatingSystem/Lab12/guest-book/backend$ docker build -t backend .
[+] Building 13.6s (10/10) FINISHED
   docker:default
[+] 13.6s (10/10) FINISHED
   docker:default
  --> [internal] load build definition from Dockerfile
  --> transferring dockerfile: 162B
  --> [internal] load metadata for docker.io/library/node:lts-alpine3.23
  --> [internal] load .dockerignore
  --> transferring context: 28B
  --> CACHED [1/5] FROM docker.io/library/node:lts-alpine3.23@sha256:c921b97d4b74f511174405745754
  --> resovive nocker.io/library/node.1ts
  --> [2/5] WORKDIR /app
  --> [3/5] COPY package*.json .
  --> [4/5] RUN npm install
  --> [5/5] COPY server.js .
  --> exporting to image
  --> exporting layers
  --> exporting manifest sha256:fdef2aF2ade44e1ec8ff983c3c5fc1752bab349ea08dce8a0ae595a3d08886bb
  --> exporting config sha256:1291a67917581ac9e79065349206998645f0a205a00fdb487
  --> exporting attestation manifest sha256:52c8348749399b7449534f5f16feba83904139584b4B543
  --> exporting manifest list sha256:f479955305183766efabe5cb3d5310103918db
  --> exporting to docker.io/library/backend:latest
  --> unpacking to docker.io/library/backend:latest
HussainNaweed@Hussain-pc:~/OperatingSystem/Lab12/gust-ook/backend$ docker images
```

Frontend image creation:

```
HussainNaweed@Hussain-pc:~/OperatingSystem/Lab12/guest-book/backend$ docker build -t backend .
[+] Building 13.6s (10/10) FINISHED                                            docker:default
--> [internal] load build definition from Dockerfile                           0.1s
--> transferring dockerfile: 162B                                              0.1s
--> [internal] load metadata for docker.io/library/node:lts-alpine3.23        0.1s
--> [internal] load .dockerignore                                             0.1s
--> transferring context: 28B                                                 0.1s
--> CACHED [1/5] FROM docker.io/library/node:lts-alpine3.23@sha256:c921b97d4b74f511174405745754 0.1s
--> => resovie nocker.io/library/node.1ts                                         0.1s
--> [2/5] WORKDIR /app                                                       0.1s
--> [3/5] COPY package*.json ./                                              0.1s
--> [4/5] RUN npm install                                                    77.7s
--> [5/5] COPY server.js .                                                 0.1s
--> exporting to image                                                       0.1s
--> => exporting layers                                                       0.1s
--> => exporting manifest sha256:fdef2aF2ade44e1ec8ff983c3c5fc1752bab349ea08dce8a0ae59fa3d08886bb 0.1s
--> => exporting config sha256:1291a67917581ac9e79065349206998645f6a205a00fdb487 0.1s
--> => exporting attestation manifest sha256:52c8348749399b7449534f5f16feba53904139584b4B543 0.1s
--> => exporting manifest list sha256:f479955305183766efabe5cb3d5310103918db 0.1s
--> => exporting to docker.io/library/backend:latest                         0.1s
--> => unpacking to docker.io/library/backend:latest                         0.1s
HussainNaweed@Hussain-pc:~/OperatingSystem/Lab12/gust-ook/backend$ docker images
```

## Webpage ScreenShot:



**docker-compose.yml File Code:**

```
1  version: "3.9"
2
3  services:
4    # MongoDB Database
5    mongodb:
6      image: mongo:7-jammy
7      container_name: guestbook-db
8      volumes:
9        - mongo_data:/data/db
10     networks:
11       - api_db_net
12
13   # Backend API
14   api:
15     image: backend
16     container_name: guestbook-api
17     environment:
18       - MONGO_URL=mongodb://mongodb:27017
19     ports:
20       - "3000:3000"
21     depends_on:
22       - mongodb
23     networks:
24       - frontend_api_net
25       - api_db_net
26
27   # Frontend
28   web:
29     image: frontend
30     container_name: guestbook-web
31     ports:
32       - "8080:80"
33     depends_on:
34       - api
35     networks:
36       - frontend_api_net
37
38   # Networks
39   networks:
40
41     frontend_api_net:
42
43     api_db_net:
44
45   # Volumes
46   volumes:
47     mongo_data:
```

## Backend/Dockerfile:

```
● ● ●  
1 FROM node:lts-alpine3.23  
2 WORKDIR /app  
3 COPY package*.json ./  
4 RUN npm install  
5 COPY server.js .  
6 EXPOSE 3000  
7 CMD ["npm", "start"]
```

Frontend/Dockerfile:

```
● ● ●  
1 FROM nginx:trixie  
2 COPY index.html /usr/share/nginx/html/  
3 EXPOSE 80
```