



NationalTextile University  
**DepartmentofComputerScience**

Subject:  
Operating Syatem

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Reg number:

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Lab no. :

14<sup>th</sup>

Docker Home task

Whole project structure:

The screenshot shows a VS Code editor with a project structure on the left and a terminal on the right. The project structure is as follows:

- Lab12/guest-book
  - backend
    - Dockerfile (U)
    - package.json (U)
    - server.js (U)
  - frontend
    - dockerfile (U)
    - index.html (U)
    - docker-compose.yml (U)

The terminal on the right shows the output of a Docker build command:

```
=> 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
```

The bottom status bar shows the user is on the 'main\*' branch of an 'Ubuntu' repository, with 0 errors, 0 warnings, and 0 suggestions. A 'Live Share' button is also visible.

Backend 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
-> => resolve docker.io/library/node:lts 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:fdef2aF2ade44e1ec8ff983c3c5fc1752bab349ea08dce8a0ae593a3d08886bb 0.1s
-> => exporting config sha256:1291a67917581ac9e79065349206998645f6a205a00fdb487 0.1s
-> => exporting attestation manifest sha256:52c8348749399b7449534f5f16feba83904139584b4B 543 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
```

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Frontend image creation:

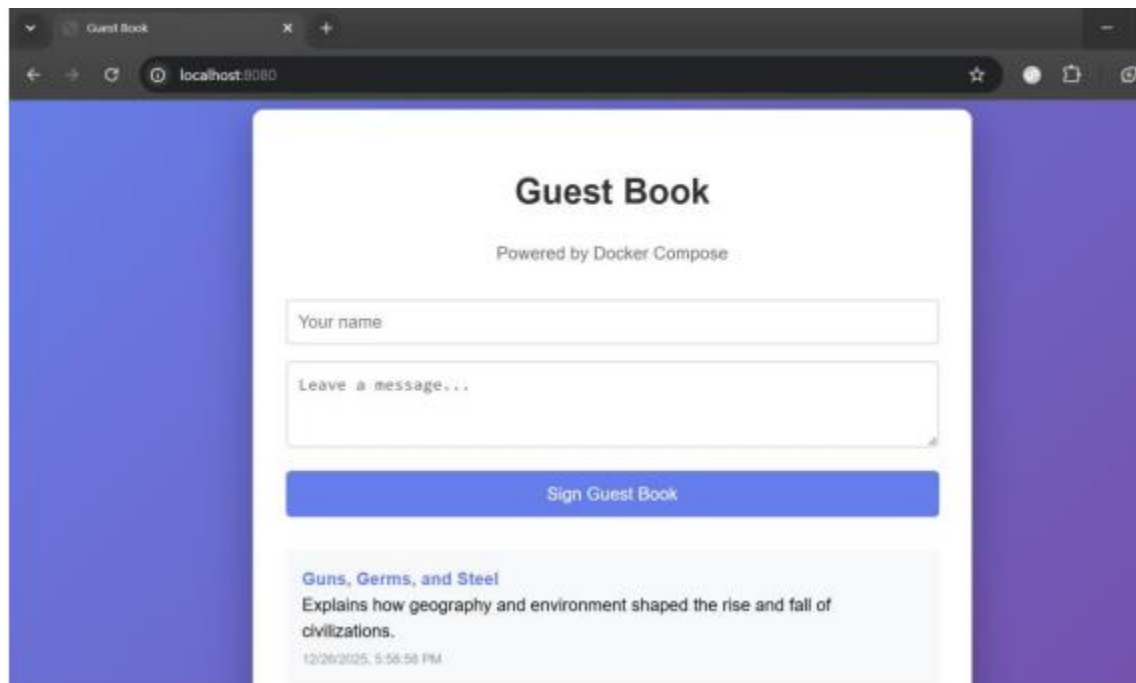
```

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
-> => resolve docker.io/library/node:lts 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 manifestsha256:fdef2aF2ade44e1ec8ff983c3c5fc1752bab349ea00dce8a0ae597a3d08886bb 0.1s
-> => exporting config sha256:1291a67917581ac9e79065349206998645f0a205a00fdb487 0.1s
-> => exporting attestation manifest sha256:52c8348749399b7449534f5fd6feba53904139584b48543 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/guest-book/backend$ docker images

```

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**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:
48
```

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
```