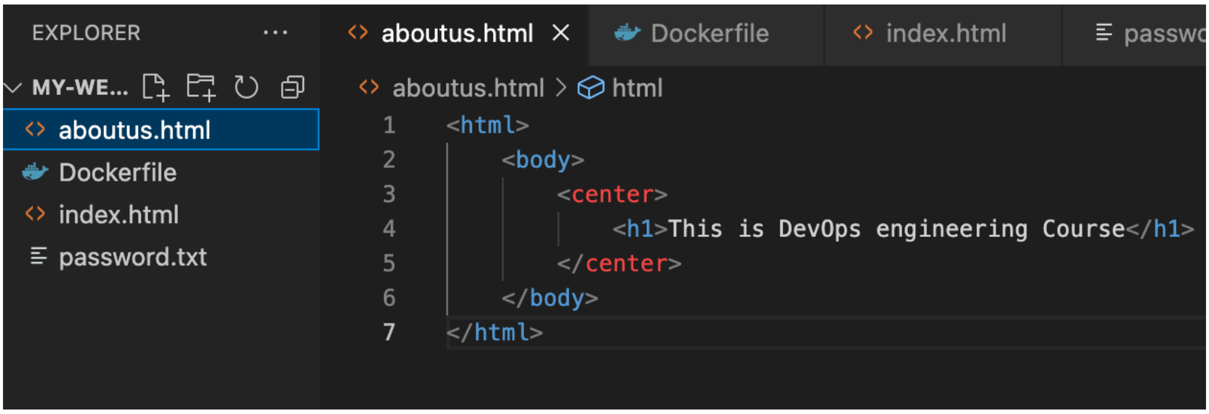
Lab Exercise 2– .dockerignore in Docker

Below is a lab exercise that can help you understand and practice using the .dockerignore file:

Create a Sample Project:

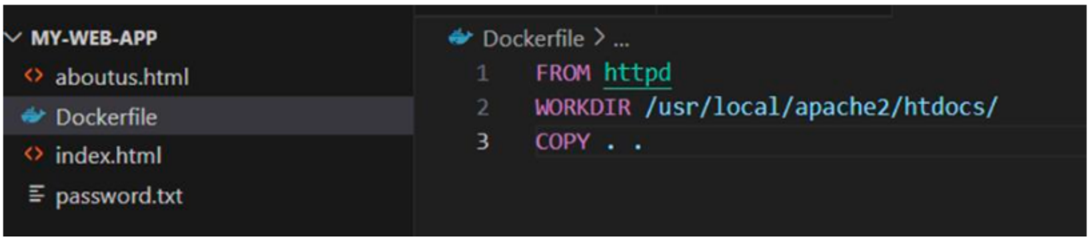
- Create a simple project directory with various types of files, including source code, configuration files, and build artifacts.



```
<html>
    <body>
        <center>
            <h1>This is DevOps engineering Course</h1>
        </center>
    </body>
</html>
```

Create a Dockerfile:

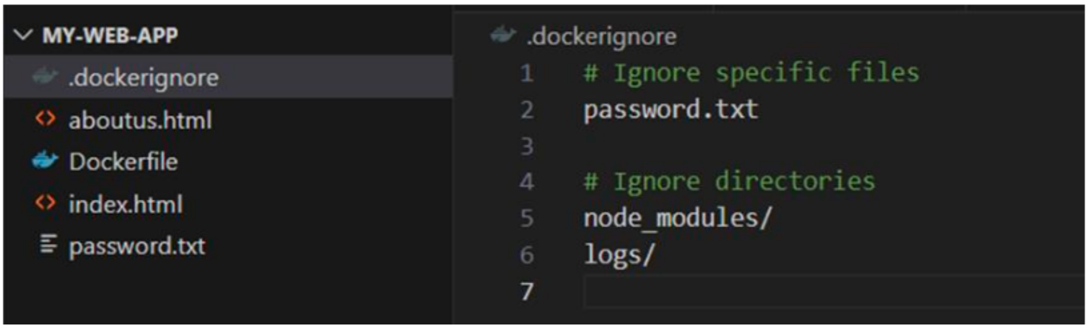
- Write a Dockerfile that specifies the build steps for your application, including any necessary dependencies.



```
FROM httpd
WORKDIR /usr/local/apache2/htdocs/
COPY . .
```

Create a .dockerignore File:

- Create a .dockerignore file in the root directory of your project.
- Add specific files or directories to the .dockerignore file that you do not want to be included in the Docker image during the build process.

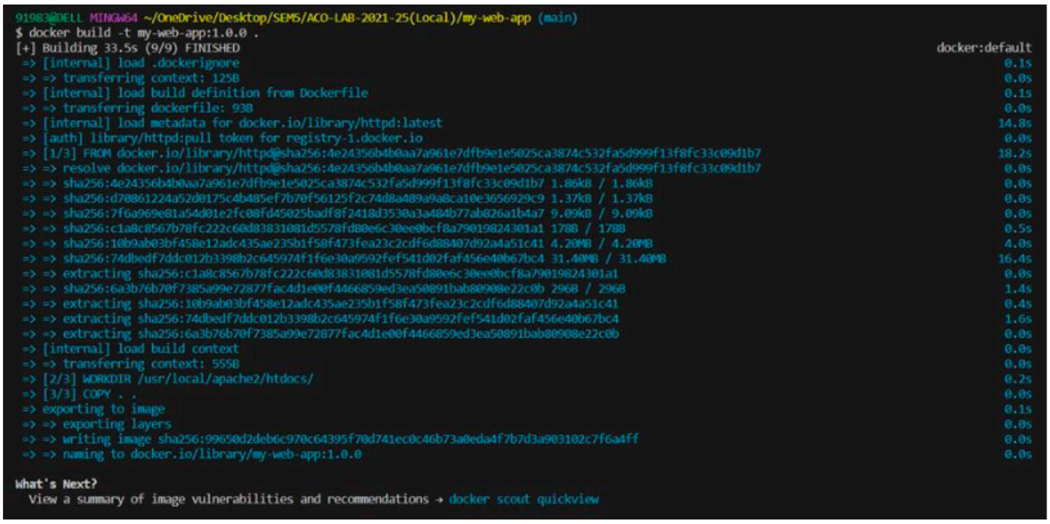


```
# Ignore specific files
password.txt

# Ignore directories
node_modules/
logs/
```

Build the Docker Image:

- Use the docker build command to build the Docker image from the Dockerfile.
- Observe the build context and check which files are being included in the Docker image.

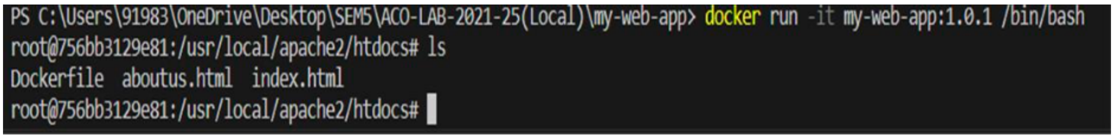


```
91983@DELL MINGW64 ~/OneDrive/Desktop/SEM5/ACO-LAB-2021-25(Local)/my-web-app (main)
$ docker build -t my-web-app:1.0.0 .
[+] Building 33.5s (9/9) FINISHED                                                                                                       docker:default
 => [internal] load .dockerignore                                                                                                                 0.1s
 => => transferring context: 125B                                                                                                                 0.0s
 => [internal] load build definition from Dockerfile                                                                                              0.1s
 => => transferring dockerfile: 93B                                                                                                               0.0s
 => [internal] load metadata for docker.io/library/httpd:latest                                                                                  14.8s
 => [auth] library/httpd:pull token for registry-1.docker.io                                                                                      0.0s
 => [1/3] FROM docker.io/library/httpd@sha256:4e24356b4b0aa7a961e7dfb9e1e5025ca3874c532fa5d999f13f8fc33c09d1b7                                   18.2s
 => => resolve docker.io/library/httpd@sha256:4e24356b4b0aa7a961e7dfb9e1e5025ca3874c532fa5d999f13f8fc33c09d1b7                                    0.0s
 => => sha256:4e24356b4b0aa7a961e7dfb9e1e5025ca3874c532fa5d999f13f8fc33c09d1b7 1.86kB / 1.86kB                                                    0.0s
 => => sha256:d70861224a52d0175c4b485ef7b70f56125f2c74d8a489a9a8ca10e3656929c9 1.37kB / 1.37kB                                                    0.0s
 => => sha256:7f6a969e81a54d01e2fc08fd45025badf8f2418d3530a3a484b77ab826a1b4a7 9.09kB / 9.09kB                                                    0.0s
 => => sha256:c1a8c8567b78fc222c60d83831081d5578fd80e6c30ee0bcf8a79019824301a1 178B / 178B                                                        0.5s
 => => sha256:10b9ab03bf458e12adc435ae235b1f58f473fea23c2cdf6d88407d92a4a51c41 4.20MB / 4.20MB                                                    4.0s
 => => sha256:74dbedf7ddc012b3398b2c645974f1f6e30a9592fef541d02faf456e40b67bc4 31.40MB / 31.40MB                                                 16.4s
 => => extracting sha256:c1a8c8567b78fc222c60d83831081d5578fd80e6c30ee0bcf8a79019824301a1                                                         0.0s
 => => sha256:6a3b76b70f7385a99e72877fac4d1e00f4466859ed3ea50891bab80908e22c0b 296B / 296B                                                        1.4s
 => => extracting sha256:10b9ab03bf458e12adc435ae235b1f58f473fea23c2cdf6d88407d92a4a51c41                                                         0.4s
 => => extracting sha256:74dbedf7ddc012b3398b2c645974f1f6e30a9592fef541d02faf456e40b67bc4                                                         1.6s
 => => extracting sha256:6a3b76b70f7385a99e72877fac4d1e00f4466859ed3ea50891bab80908e22c0b                                                         0.0s
 => [internal] load build context                                                                                                                 0.0s
 => => transferring context: 555B                                                                                                                 0.0s
 => [2/3] WORKDIR /usr/local/apache2/htdocs/                                                                                                      0.2s
 => [3/3] COPY . .                                                                                                                                0.0s
 => exporting to image                                                                                                                            0.1s
 => => exporting layers                                                                                                                           0.0s
 => => writing image sha256:99650d2deb6c970c64395f70d741ec0c46b73a0eda4f7b7d3a903102c7f6a4ff                                                      0.0s
 => => naming to docker.io/library/my-web-app:1.0.0                                                                                               0.0s

What's Next?
  View a summary of image vulnerabilities and recommendations → docker scout quickview
```

Modify .dockerignore and Rebuild:

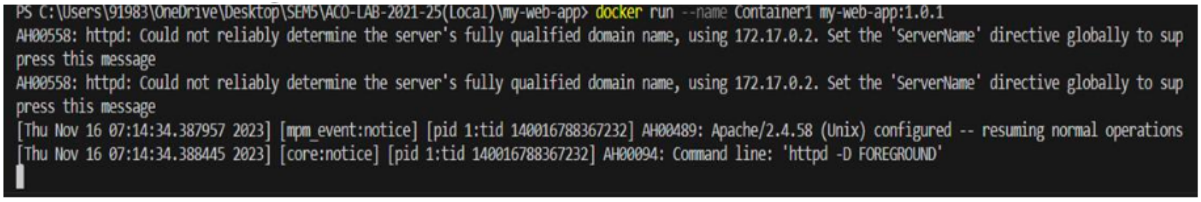
- Modify the .dockerignore file to exclude different types of files or directories from the Docker image.
- Rebuild the Docker image and observe the changes in the build context.



```
PS C:\Users\91983\OneDrive\Desktop\SEM5\ACO-LAB-2021-25(Local)\my-web-app> docker run -it my-web-app:1.0.1 /bin/bash
root@756bb3129e81:/usr/local/apache2/htdocs# ls
Dockerfile  aboutus.html  index.html
root@756bb3129e81:/usr/local/apache2/htdocs# 
```

Test the Docker Image:

- Run the Docker image as a container using the docker run command.
- Verify that the container works as expected, despite certain files being excluded from the Docker image.



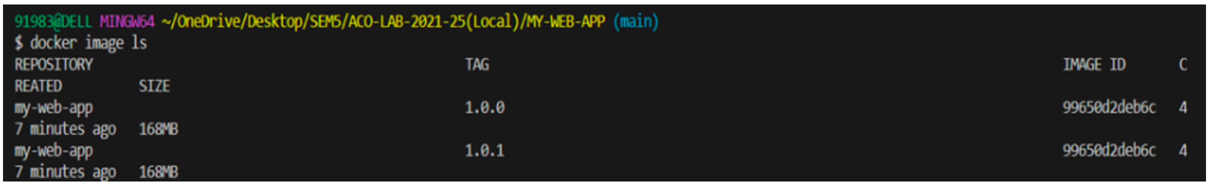
```
PS C:\Users\91983\OneDrive\Desktop\SEM5\ACO-LAB-2021-25(Local)\my-web-app> docker run --name Container1 my-web-app:1.0.1
AH00558: httpd: Could not reliably determine the server's fully qualified domain name, using 172.17.0.2. Set the 'ServerName' directive globally to sup
press this message
AH00558: httpd: Could not reliably determine the server's fully qualified domain name, using 172.17.0.2. Set the 'ServerName' directive globally to sup
press this message
[Thu Nov 16 07:14:34.387957 2023] [mpm_event:notice] [pid 1:tid 140016788367232] AH00489: Apache/2.4.58 (Unix) configured -- resuming normal operations
[Thu Nov 16 07:14:34.388445 2023] [core:notice] [pid 1:tid 140016788367232] AH00094: Command line: 'httpd -D FOREGROUND'
```

Optimize the .dockerignore File:

- Experiment with different patterns and wildcards in the .dockerignore file to optimize the build context and reduce the image size.

Check Image Size and Contents:

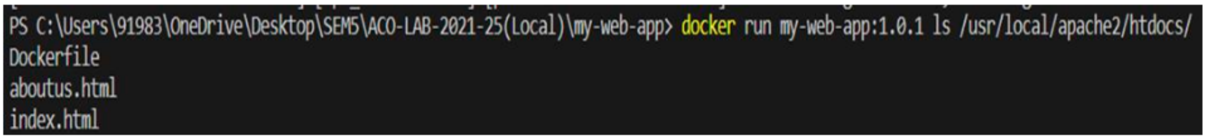
- Use the docker image ls and docker image inspect commands to check the size of the Docker image and its contents.



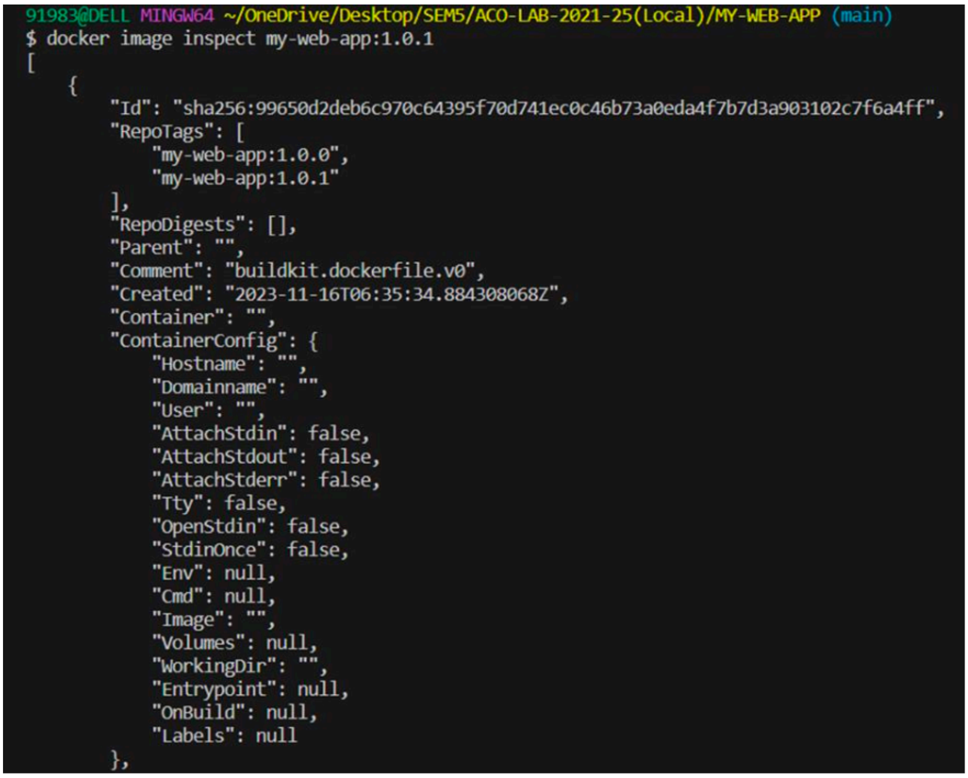
```
91983@DELL MINGW64 ~/OneDrive/Desktop/SEM5/ACO-LAB-2021-25(Local)/MY-WEB-APP (main)
$ docker image ls
REPOSITORY                                            TAG                                           IMAGE ID       C
REATED          SIZE
my-web-app                                            1.0.0                                         99650d2deb6c   4
7 minutes ago   168MB
my-web-app                                            1.0.1                                         99650d2deb6c   4
7 minutes ago   168MB
```

Update .dockerignore for CI/CD:

- Modify the .dockerignore file to optimize the build context and reduce build times in a continuous integration and continuous deployment (CI/CD) pipeline.



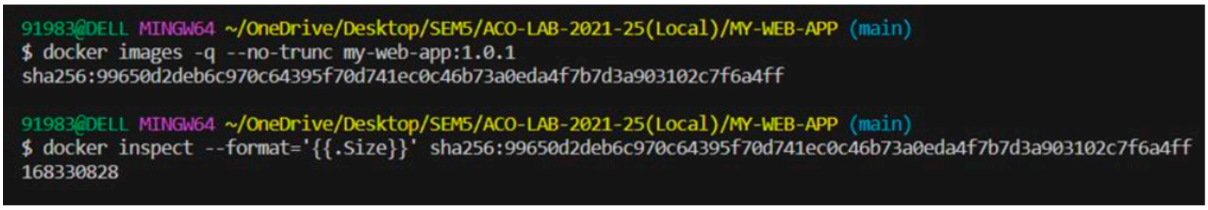
```
PS C:\Users\91983\OneDrive\Desktop\SEM5\ACO-LAB-2021-25(Local)\my-web-app> docker run my-web-app:1.0.1 ls /usr/local/apache2/htdocs/
Dockerfile
aboutus.html
index.html
```



```
91983@DELL MINGW64 ~/OneDrive/Desktop/SEM5/ACO-LAB-2021-25(Local)/MY-WEB-APP (main)
$ docker image inspect my-web-app:1.0.1
[
    {
        "Id": "sha256:99650d2deb6c970c64395f70d741ec0c46b73a0eda4f7b7d3a903102c7f6a4ff",
        "RepoTags": [
            "my-web-app:1.0.0",
            "my-web-app:1.0.1"
        ],
        "RepoDigests": [],
        "Parent": "",
        "Comment": "buildkit.dockerfile.v0",
        "Created": "2023-11-16T06:35:34.884308068Z",
        "Container": "",
        "ContainerConfig": {
            "Hostname": "",
            "Domainname": "",
            "User": "",
            "AttachStdin": false,
            "AttachStdout": false,
            "AttachStderr": false,
            "Tty": false,
            "OpenStdin": false,
            "StdinOnce": false,
            "Env": null,
            "Cmd": null,
            "Image": "",
            "Volumes": null,
            "WorkingDir": "",
            "Entrypoint": null,
            "OnBuild": null,
            "Labels": null
        },
```

Documentation and Best Practices:

- Document your findings and the best practices for using the .dockerignore file in your projects.



```
91983@DELL MINGW64 ~/OneDrive/Desktop/SEM5/ACO-LAB-2021-25(Local)/MY-WEB-APP (main)
$ docker images -q --no-trunc my-web-app:1.0.1
sha256:99650d2deb6c970c64395f70d741ec0c46b73a0eda4f7b7d3a903102c7f6a4ff

91983@DELL MINGW64 ~/OneDrive/Desktop/SEM5/ACO-LAB-2021-25(Local)/MY-WEB-APP (main)
$ docker inspect --format='{{.Size}}' sha256:99650d2deb6c970c64395f70d741ec0c46b73a0eda4f7b7d3a903102c7f6a4ff
168330828
```

Through this exercise, you'll gain a better understanding of how to use the .dockerignore file effectively to optimize Docker image builds and reduce image sizes. Adjust the exercise based on your specific project requirements.