



# **Application Containerization**

## **And**

# **Orchestration Lab**

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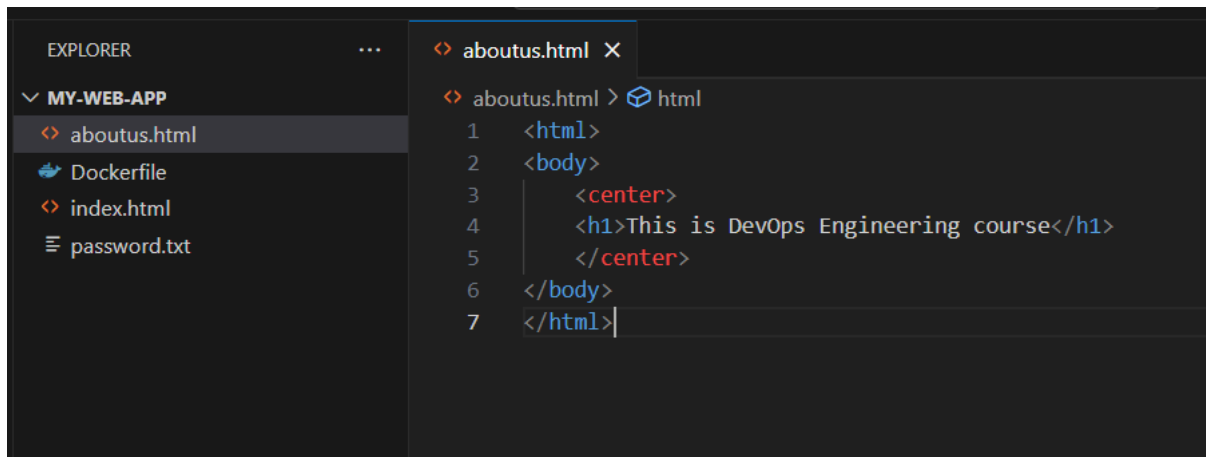
**Batch – DevOps B4**

## EXPERIMENT-2

### AIM : .dockerignore in Docker

#### Create a Sample Project:

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

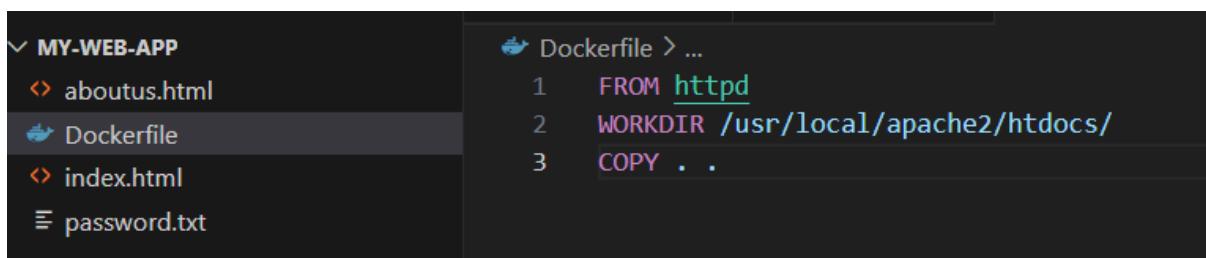


```
EXPLORER
  ...
  ▼ MY-WEB-APP
    < aboutus.html
    Dockerfile
    < index.html
    password.txt

  aboutus.html x
    aboutus.html > html
    1 <html>
    2 <body>
    3   <center>
    4     <h1>This is DevOps Engineering course</h1>
    5   </center>
    6 </body>
    7 </html>
```

#### Create a Dockerfile:

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

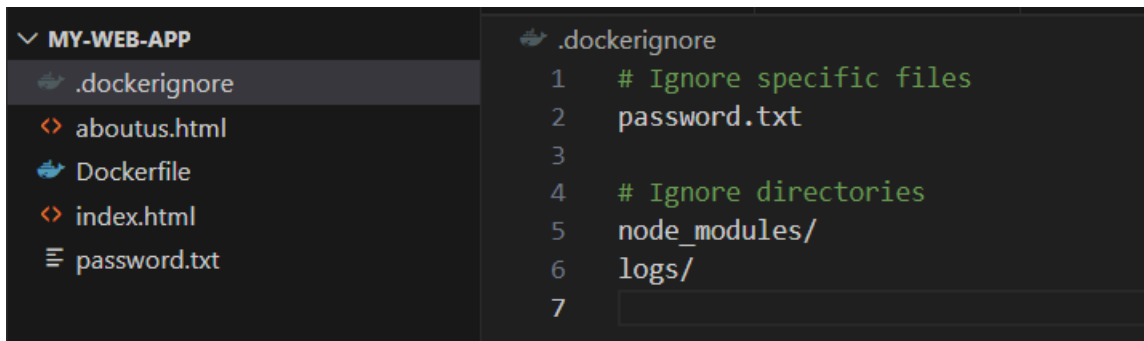


```
MY-WEB-APP
  < aboutus.html
  Dockerfile
  < index.html
  password.txt

  Dockerfile > ...
  1 FROM httpd
  2 WORKDIR /usr/local/apache2/htdocs/
  3 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.



## Build the Docker Image:

- Use the docker build command to build the Docker image from the Dockerfile.

```
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
=> [internal] load .dockerignore                                docker:default 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
=> => 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
```

- Observe the build context and check which files are being included in the Docker image.

```
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#
```

## 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.

## 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 suppress 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 suppress 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
my-web-app	1.0.0	99650d2deb6c	4
7 minutes ago			
my-web-app	1.0.1	99650d2deb6c	4
7 minutes ago			

```
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
    },
  },
]

```

```

{
  "DockerVersion": "",
  "Author": "",
  "Config": {
    "Hostname": "",
    "Domainname": "",
    "User": "",
    "AttachStdin": false,
    "AttachStdout": false,
    "AttachStderr": false,
    "ExposedPorts": {
      "80/tcp": {}
    },
    "Tty": false,
    "OpenStdin": false,
    "StdinOnce": false,
    "Env": [
      "PATH=/usr/local/apache2/bin:/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin",
      "HTTPD_PREFIX=/usr/local/apache2",
      "HTTPD_VERSION=2.4.58",
      "HTTPD_SHA256=f16d72a078210a54c47dd5bef2f8b9b8a01d94909a51453956b3ec6442ea4c5",
      "HTTPD_PATCHES="
    ],
    "Cmd": [
      "httpd-foreground"
    ],
    "Image": "",
    "Volumes": null,
    "WorkingDir": "/usr/local/apache2/htdocs/",
    "Entrypoint": null,
    "OnBuild": null,
    "Labels": null,
    "StopSignal": "SIGWINCH"
  },
}

```

```

    "Architecture": "amd64",
    "Os": "linux",
    "Size": 168330828,
    "VirtualSize": 168330828,
    "GraphDriver": {
      "Data": {
        "LowerDir": "/var/lib/docker/overlay2/raghyrahvv19aq5392566yf8/diff:/var/lib/docker/overlay2/778f58b3cc6d9c17e38271347f0f0aaada0e2f1f754b6f1f85b9bcc5659387e5/diff:/var/lib/docker/overlay2/c9c6bf88e15953edf846934fcdeefda71cc3beba523582573907a91c5397bc42/diff:/var/lib/docker/overlay2/92e60c772046397f63b9301cd8151227736843736aa6d7712611f735ca972538/diff:/var/lib/docker/overlay2/dc91793ba1cf6c60fb1868a28f78318e0b9934e8fcfe7f7ed0483dee4f8ea57a/diff:/var/lib/docker/overlay2/eac545cc9cc2c7297fc771d82e491e8fb68004e6b029ac08121285c5af3fda3b/diff",
        "MergedDir": "/var/lib/docker/overlay2/t9k0rrmz2y5kc2971zoso8j2z/merged",
        "UpperDir": "/var/lib/docker/overlay2/t9k0rrmz2y5kc2971zoso8j2z/diff",
        "WorkDir": "/var/lib/docker/overlay2/t9k0rrmz2y5kc2971zoso8j2z/work"
      }
    },
    "Name": "overlay2"
  },
  "RootFS": {
    "Type": "layers",
    "Layers": [
      "sha256:ec983b16636050e69677eb81537e955ab927757c23aaf73971ecf5f71fcc262a",
      "sha256:2905795cb5b834a2e1912922d93bb6f4188c4ae4c786025a2b2337f675ee6e57",
      "sha256:e0ba343b5cab49f2b354f240b5bccf1c29b4ffcefc006102fbaef6ec2bf0fc",
      "sha256:5ca84525a215131486e53202ee9d047f6b7c417ffa5d5f487c8ce60adab3af4d",
      "sha256:cdae29f197b2311e9cb11606d872df70e4b2041d48db081854d6a82c62d3f55d",
      "sha256:5f70bf18a086007016e948b04aed3b82103a36bea41755b6cddfaf10ace3c6ef",
      "sha256:f15bf7eea301210fb694c774d8f0ff1576ef59429a570fa2f7b81ed8fe4ae4ab"
    ]
  },
  "Metadata": {
    "LastTagTime": "2023-11-16T07:03:19.234628065Z"
  }
}
]

```

- Command that list the hash id of the image being created and then list the size of the image using its hash id :

```

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

```

## Documentation and Best Practices:

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

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.