



# **Application Containerization And Orchestration Lab**

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**Batch – DevOps B4**

**Submitted to**

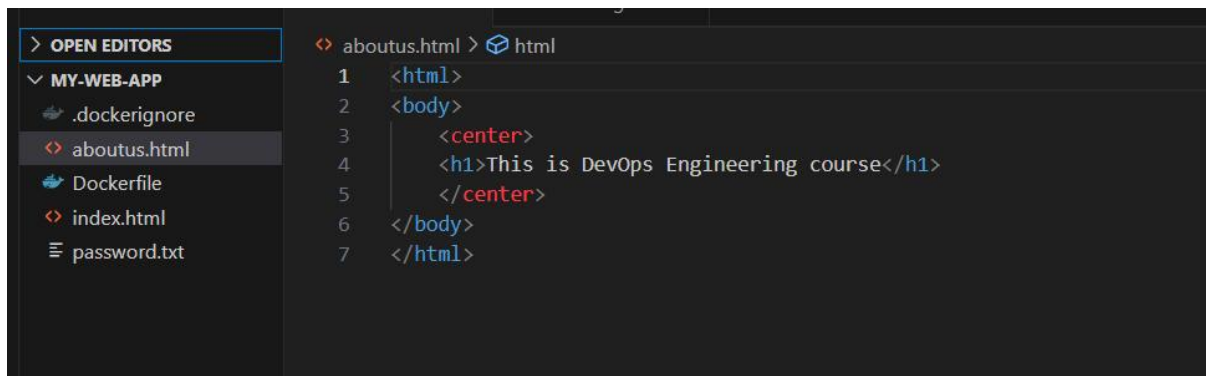
**– Dr. Hitesh Kumar Sharma**

## 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.

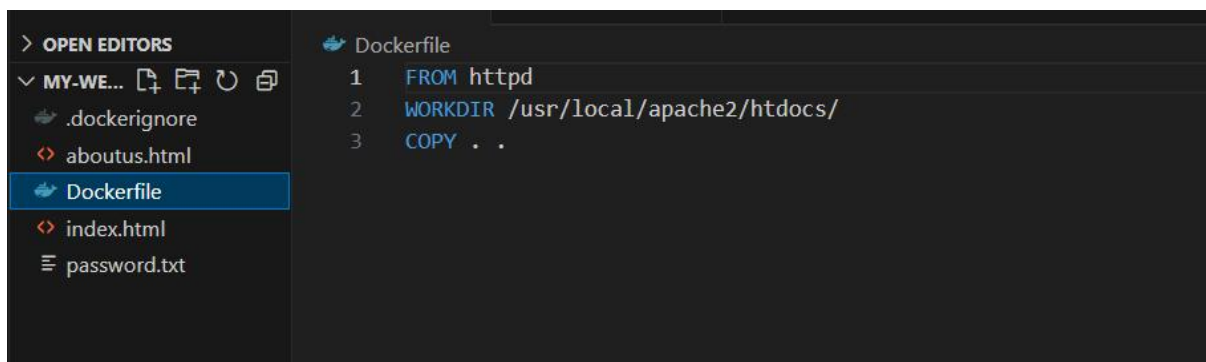


```
> OPEN EDITORS
MY-WEB-APP
  .dockerignore
  aboutus.html
  Dockerfile
  index.html
  password.txt

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.

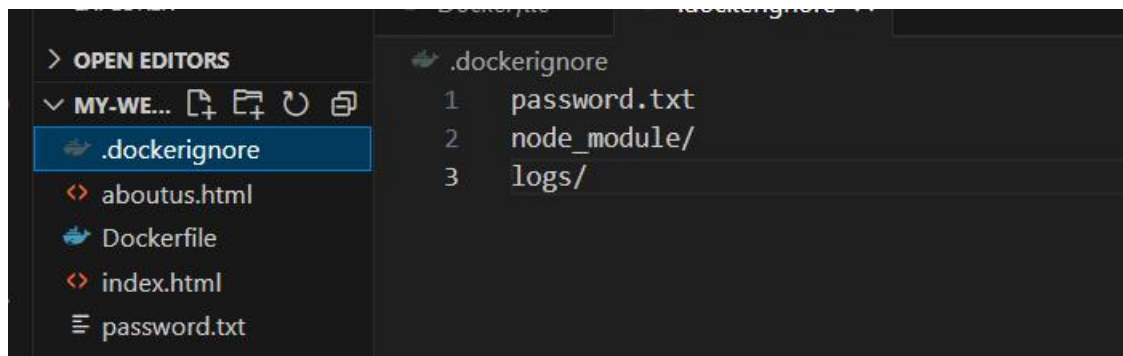


```
> OPEN EDITORS
MY-WE... [Icons]
  .dockerignore
  aboutus.html
  Dockerfile
  index.html
  password.txt

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

```
PS C:\Users\Vidhyarthi\Desktop\ACO-LAB-2021-25\my-web-app> docker build -t my-web-app:1.0.0 .
[+] Building 39.8s (9/9) FINISHED
=> [internal] load build definition from Dockerfile                                docker:default 0.2s
=> => transferring dockerfile: 93B                                              0.1s
=> [internal] load .dockerignore                                                 0.2s
=> => transferring context: 73B                                                 0.1s
=> [internal] load metadata for docker.io/library/httpd:latest                 5.3s
=> [auth] library/httpd:pull token for registry-1.docker.io                   0.0s
=> [1/3] FROM docker.io/library/httpd@sha256:04551bc91cc03314eaab20d23609339aeb2ae694fc2e337d0afad429ec22c5a 29.2s
=> => resolve docker.io/library/httpd@sha256:04551bc91cc03314eaab20d23609339aeb2ae694fc2e337d0afad429ec22c5a 0.2s
=> => sha256:a6ca7b52a41549f13f7de6aeac4ab6ffebd41585fbf2273f00fd6e82bb721949 9.09kB / 9.09kB 0.0s
=> => sha256:5728e491734b6e91c3510258efdceee6920776c3a74305b8dcc93182261c2ad 31.40MB / 31.40MB 21.8s
=> => sha256:04551bc91cc03314eaab20d23609339aeb2ae694fc2e337d0afad429ec22c5a 1.86kB / 1.86kB 0.0s
=> => sha256:42ed559bb8529283236b537155e345b47051ed082200c7d7e155405b3e169235 1.37kB / 1.37kB 0.0s
=> => sha256:424de2a100003656ccbef24ffdf32934af62ac494edf407cf38751f56020c6a0 177B / 177B 0.5s
=> => sha256:6d9a0131505f1e1918be839f1ae1ea95a8346897de160e1b2e67c404d8eb4e17 4.20MB / 4.20MB 5.3s
=> => extracting sha256:424de2a100003656ccbef24ffdf32934af62ac494edf407cf38751f56020c6a0 0.0s
=> => sha256:20d3235e84ad258aa9c424aee0e217ac00833960367b5723cb639a0091853184 297B / 297B 1.3s
=> => extracting sha256:6d9a0131505f1e1918be839f1ae1ea95a8346897de160e1b2e67c404d8eb4e17 1.2s
=> => extracting sha256:5728e491734b6e91c3510258efdceee6920776c3a74305b8dcc93182261c2ad 6.3s
=> => extracting sha256:20d3235e84ad258aa9c424aee0e217ac00833960367b5723cb639a0091853184 0.0s
=> [internal] load build context                                                0.2s
=> => transferring context: 503B                                              0.1s
=> [2/3] WORKDIR /usr/local/apache2/htdocs/                                  2.3s
=> [3/3] COPY . .                                                            1.0s
=> => exporting to image                                                       0.3s
=> => exporting layers                                                         0.3s
=> => writing image sha256:db4b11c375c1050460a722795e55a0861249ea480b9457c0821499f3496b682b 0.0s
=> => naming to docker.io/library/my-web-app:1.0.0                          0.0s
```

```
PS C:\Users\Vidhyarthi\Desktop\ACO-LAB-2021-25\my-web-app> docker run -it my-web-app:1.0.0 /bin/bash
root@ff5fa2a80ee2:/usr/local/apache2/htdocs# ls
Dockerfile aboutus.html index.html
root@ff5fa2a80ee2:/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\Vidarthi\Desktop\ACO-LAB-2021-25\my-web-app> docker run --name Container1 my-web-app:1.0.0
AH00558: httpd: Could not reliably determine the server's fully qualified domain name, using 172.17.0.3. S
lly to suppress this message
AH00558: httpd: Could not reliably determine the server's fully qualified domain name, using 172.17.0.3. S
lly to suppress this message
[Fri Dec 01 15:41:08.622882 2023] [mpm_event:notice] [pid 1:tid 140223787415424] AH00489: Apache/2.4.58 (U
operations
[Fri Dec 01 15:41:08.632908 2023] [core:notice] [pid 1:tid 140223787415424] AH00094: Command line: 'httpd
```

## 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.

```
PS C:\Users\Vidarthi\Desktop\ACO-LAB-2021-25\my-web-app> docker image ls
```

REPOSITORY	TAG	IMAGE
my-web-app	1.0.0	db4b11
c375c1	3 hours ago	168MB
<none>	<none>	96ab69
a0b5c8	6 days ago	467MB
nginx	latest	a6bd71

```
PS C:\Users\Vidarthi\Desktop\ACO-LAB-2021-25\my-web-app> docker run my-web-app:1.0.0 ls /usr/local/apache2/htdocs/
Dockerfile
aboutus.html
index.html
```

```
PS C:\Users\Vidarthi\Desktop\ACO-LAB-2021-25\my-web-app> docker image inspect my-web-app:1.0.0
[
```

```
{
  "Id": "sha256:db4b11c375c1050460a722795e55a0861249ea480b9457c0821499f3496b682b",
  "RepoTags": [
    "my-web-app:1.0.0"
  ],
  "RepoDigests": [],
  "Parent": "",
  "Comment": "buildkit.dockerfile.v0",
  "Created": "2023-12-01T15:33:42.078619951Z",
  "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=fa16d72a078210a54c47dd5bef2f8b9b8a01d94909a51453956b3ec6442ea4c5",
        "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": 168330784,
"VirtualSize": 168330784,
"GraphDriver": {
    "Data": {
        "LowerDir": "/var/lib/docker/overlay2/v5cfr9hde53zjzoippjla49n9/diff:/var/lib/docker/overl
45fe6d4bcf97341ab5494ba430dbf1/diff:/var/lib/docker/overlay2/b46c906ef34c45373f2ebfaa135c738e771859a4c19

```

```

b/docker/overlay2/e4fa5af31d6e137eae75fff67d3b16cd01b6ae7c964779572e93312d472fba/diff:/var/lib/docker/o
74e2ed49453f0bebbbbae5382e0e73ef5c51/diff:/var/lib/docker/overlay2/920ae855ceeeb671a596b95e2ac282236b5285
    "MergedDir": "/var/lib/docker/overlay2/fgl dne2nuqhn0ay4bdfn0ca2n/merged",
    "UpperDir": "/var/lib/docker/overlay2/fgl dne2nuqhn0ay4bdfn0ca2n/diff",
    "WorkDir": "/var/lib/docker/overlay2/fgl dne2nuqhn0ay4bdfn0ca2n/work"
},
    "Name": "overlay2"
},
"RootFS": {
    "Type": "layers",
    "Layers": [
        "sha256:92770f546e065c4942829b1f0d7d1f02c2eb1e6acf0d1bc08ef0bf6be4972839",
        "sha256:fad7e2250d8fefbd8524054837403921b468448b6bae1ee439bb793e254b6725",
        "sha256:27496babcf700a08c0a14777dd4bb818273e8cc9f77d526fcb4554043cff291d9",
        "sha256:28f18e7dc61c56a068f00ec92dde62cf9de21cbce0eb9a8395c6617e2fef9463",
        "sha256:b9bf93af811f6900f445158ab648fd4868b69b770908142b897772e6bb8c2a2f",
        "sha256:5f70bf18a086007016e948b04aed3b82103a36bea41755b6cddf10ace3c6ef",
        "sha256:f7a1b9ce254bc111464d79a1ea2e504a1bb1763c9ad5d4a87d2465e744175d63"
    ]
},
    "Metadata": {
        "LastTagTime": "2023-12-01T15:33:42.482624249Z"
    }
}
]
PS C:\Users\Widvarthi\Desktop\ACQ-LAB-2021-25\my-web-app>

```

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

```
PS C:\Users\Vidarthi\Desktop\ACO-LAB-2021-25\my-web-app> docker images -q --no-trunc my-web-app:1.0.0
sha256:db4b11c375c1050460a722795e55a0861249ea480b9457c0821499f3496b682b
PS C:\Users\Vidarthi\Desktop\ACO-LAB-2021-25\my-web-app>
PS C:\Users\Vidarthi\Desktop\ACO-LAB-2021-25\my-web-app> docker inspect --format='{{.Size}}' sha256:db4b11c375c1050460a722795e55a0861249ea480b9457c0821499f3496b682b
168330784
Activate Windows
Go to Settings to activate Windows.
```

## 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.