Application Containerization

And

Orchestration Lab

Lab Instructor – Dr. Hitesh Kumar Sharma

Submitted By – Swati Pal

SAP ID – 500097368
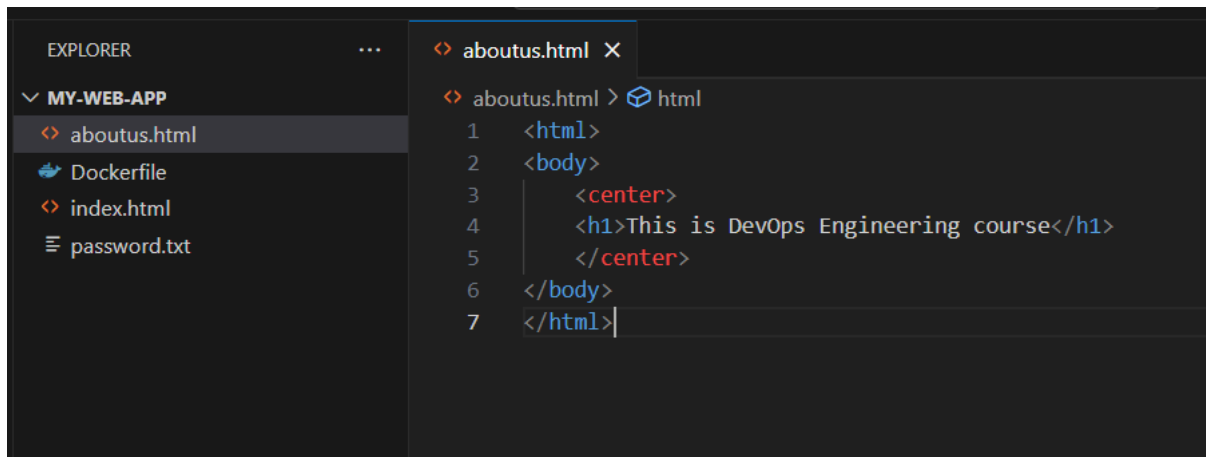
Enrolment no. – R2142211342

Batch – DevOps B4

EXPERIMENT-2

<u>AIM</u> : .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.
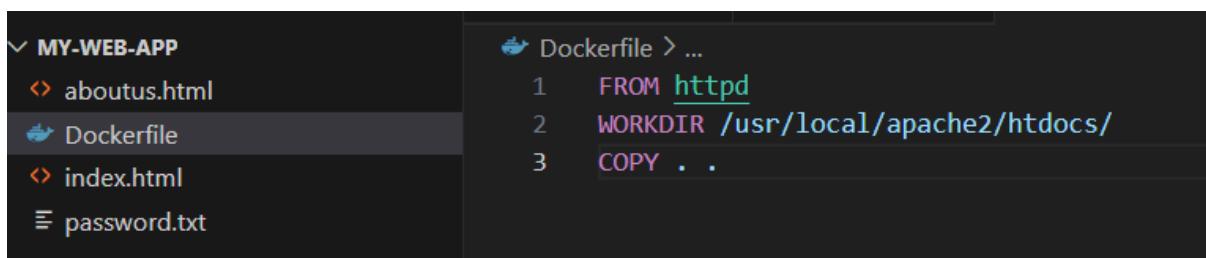

Create a Dockerfile:

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

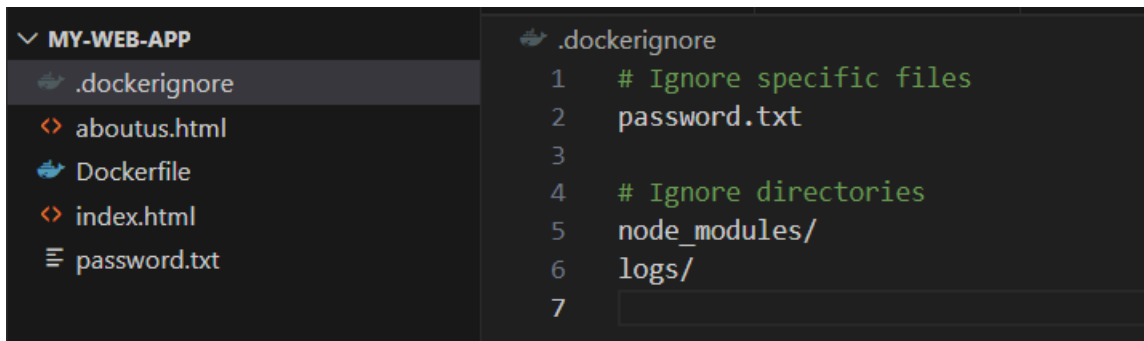**Create a .dockerignore File:**

- 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.

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 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
```

```
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=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": 168330828,
        "VirtualSize": 168330828,
        "GraphDriver": {
            "Data": {
                "LowerDir": "/var/lib/docker/overlay2/raghyrahvvvl9aq5392566yf8/diff:/var/lib/docker/overlay2/778f58b3cc6d9c17e38271347f0f0aaada0e2f1f7
54b6f1f85b9bcc5659387e5/diff:/var/lib/docker/overlay2/c9c6bf88e15953edf846934fcdeefda71cc3beba523582573907a91c5397bc42/diff:/var/lib/docker/overlay2/92
e60c772046397f63b9301cd8151227736843736aa6d7712611f735ca972538/diff:/var/lib/docker/overlay2/dc91793ba1cf6c60fb1868a28f78318e0b9934e8fcfe7f7ed0483dee4f
8ea57a/diff:/var/lib/docker/overlay2/eac545cc9cc2c7297fc771d82e491e8fb68004e6b029ac08121285c5af3fda3b/diff",
                "MergedDir": "/var/lib/docker/overlay2/t9k0rrmz2y5kc297lzoso8j2z/merged",
                "UpperDir": "/var/lib/docker/overlay2/t9k0rrmz2y5kc297lzoso8j2z/diff",
                "WorkDir": "/var/lib/docker/overlay2/t9k0rrmz2y5kc297lzoso8j2z/work"
            },
            "Name": "overlay2"
        },
        "RootFS": {
            "Type": "layers",
            "Layers": [
                "sha256:ec983b16636050e69677eb81537e955ab927757c23aaf73971ecf5f71fcc262a",
                "sha256:2905795cb5b834a2e1912922d93bb6f4188c4ae4c786025a2b2337f675ee6e57",
                "sha256:e0ba343b5cab49f2b354f240b5bccf1c29b4ffcef0cc006102fbaef6ec2bf0fc",
                "sha256:5ca84525a215131486e53202ee9d047f6b7c417ffafd5f487c8ce60adab3af4d",
                "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.