Application Containerization And Orchestration Lab

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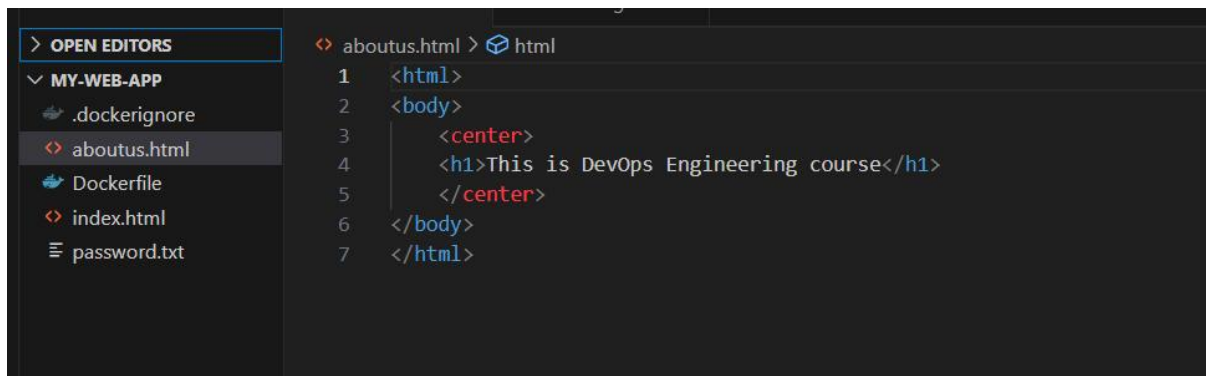
Batch – DevOps B4

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.
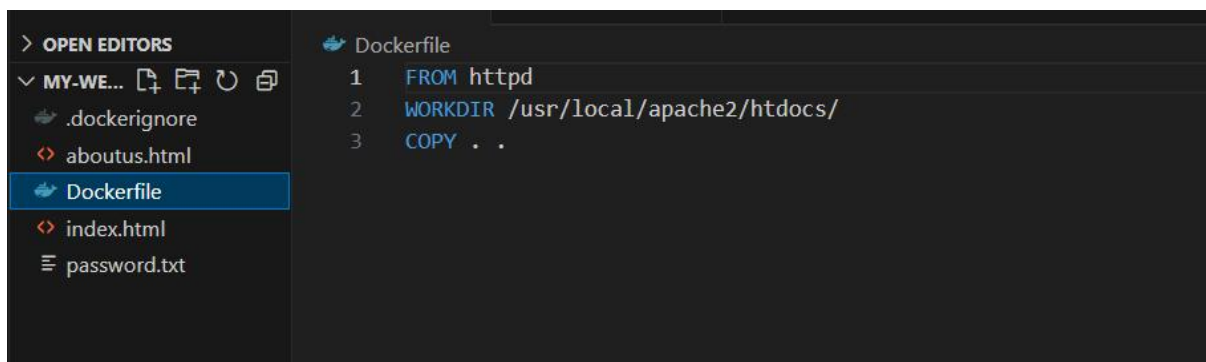

Create a Dockerfile:

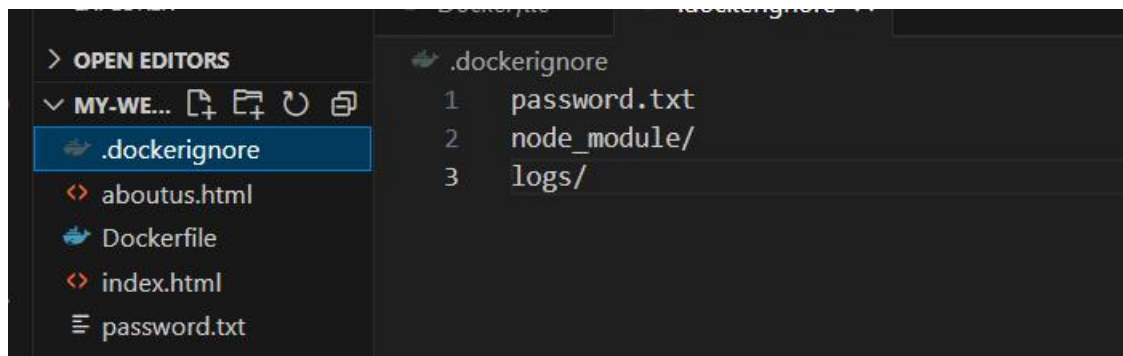- Write a Dockerfile that specifies the build steps for your application, including any necessary dependencies.

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\Vidyarthi\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\Vidyarthi\Desktop\ACO-LAB-2021-25\my-web-app> docker image ls
REPOSITORY                                              TAG                                        IMAGE
ID          CREATED         SIZE
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\Vidyarthi\Desktop\ACO-LAB-2021-25\my-web-app> docker run my-web-app:1.0.0 ls /usr/local/apache2/htdocs/
Dockerfile
aboutus.html                                                                                   Activate
index.html                                                                                     Go to Settin
```

```
PS C:\Users\Vidyarthi\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/overla
45fe6d4bcf97341ab5494ba430dbf1/diff:/var/lib/docker/overlay2/b46c906ef34c45373f2ebfaa135c738e771859a4c19
```

```
b/docker/overlay2/e4fa5af31d6e137eaecb75fff67d3b16cd01b6ae7c964779572e93312d472fba/diff:/var/lib/docker/ov
74e2ed49453f0bebbbbea5382e0e73ef5c51/diff:/var/lib/docker/overlay2/920ae855ceeeb671a596b95e2ac282236b5285
            "MergedDir": "/var/lib/docker/overlay2/fgldne2nuqhn0ay4bdfn0ca2n/merged",
            "UpperDir": "/var/lib/docker/overlay2/fgldne2nuqhn0ay4bdfn0ca2n/diff",
            "WorkDir": "/var/lib/docker/overlay2/fgldne2nuqhn0ay4bdfn0ca2n/work"
        },
        "Name": "overlay2"
    },
    "RootFS": {
        "Type": "layers",
        "Layers": [
            "sha256:92770f546e065c4942829b1f0d7d1f02c2eb1e6acf0d1bc08ef0bf6be4972839",
            "sha256:fad7e2250d8fefbd8524054837403921b468448b6bae1ee439bb793e254b6725",
            "sha256:27496babc700a08c0a14777dd4bb818273e8cc9f77d526fcb4554043cff291d9",
            "sha256:28f18e7dc61c56a068f00ec92dde62cf9de21cbce0eb9a8395c6617e2fef9463",
            "sha256:b9bf93af811f6900f445158ab648fd4868b69b770908142b897772e6bb8c2a2f",
            "sha256:5f70bf18a086007016e948b04aed3b82103a36bea41755b6cddfaf10ace3c6ef",
            "sha256:f7a1b9ce254bc111464d79a1ea2e504a1bb1763c9ad5d4a87d2465e744175d63"
        ]
    },
    "Metadata": {
        "LastTagTime": "2023-12-01T15:33:42.482624249Z"
    }
}
]
PS C:\Users\Vidyarthi\Desktop\ACO-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\Vidyarthi\Desktop\ACO-LAB-2021-25\my-web-app> docker images -q --no-trunc my-web-app:1.0.0
  sha256:db4b11c375c1050460a722795e55a0861249ea480b9457c0821499f3496b682b
  PS C:\Users\Vidyarthi\Desktop\ACO-LAB-2021-25\my-web-app>
  PS C:\Users\Vidyarthi\Desktop\ACO-LAB-2021-25\my-web-app> docker inspect --format='{{.Size}}' sha256:db4b11c375c1050460a722795e55a0861249ea48
  0b9457c0821499f3496b682b                                                                          Activate Windows
  168330784                                                                                         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.