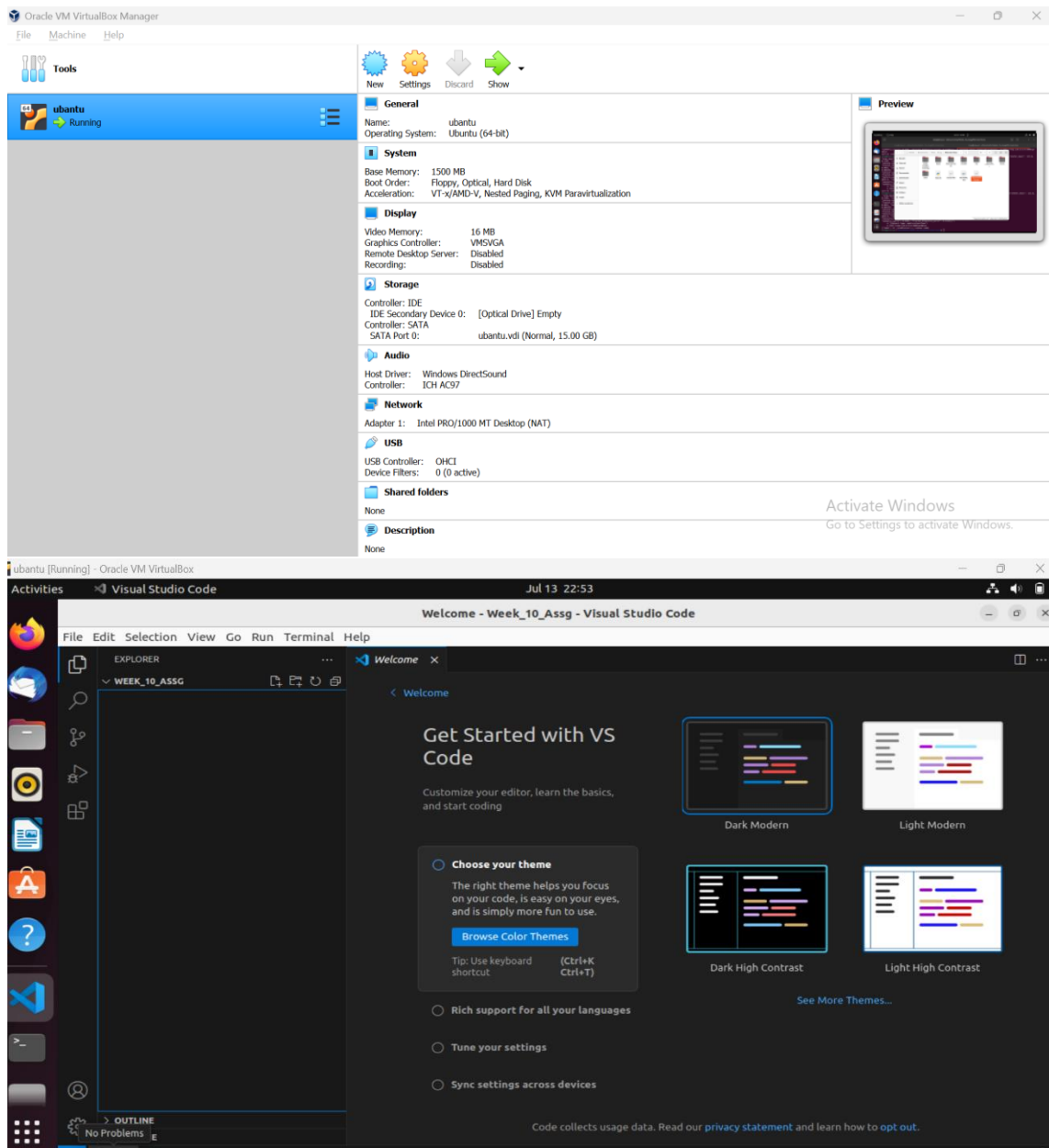
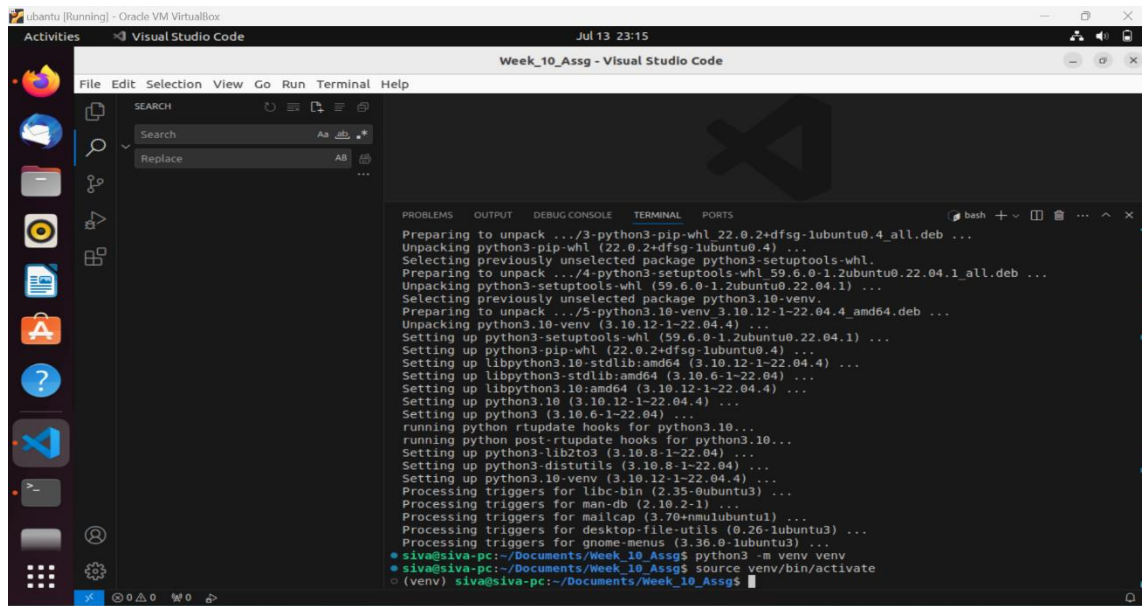


WEEK10 -WEEK 12 ASSIGNMENT

1. Host a Ubuntu Virtual Machine using Oracle VM Virtual Box

Solution : Hosted Ubuntu Virtual machine using oracle VM Virtual box

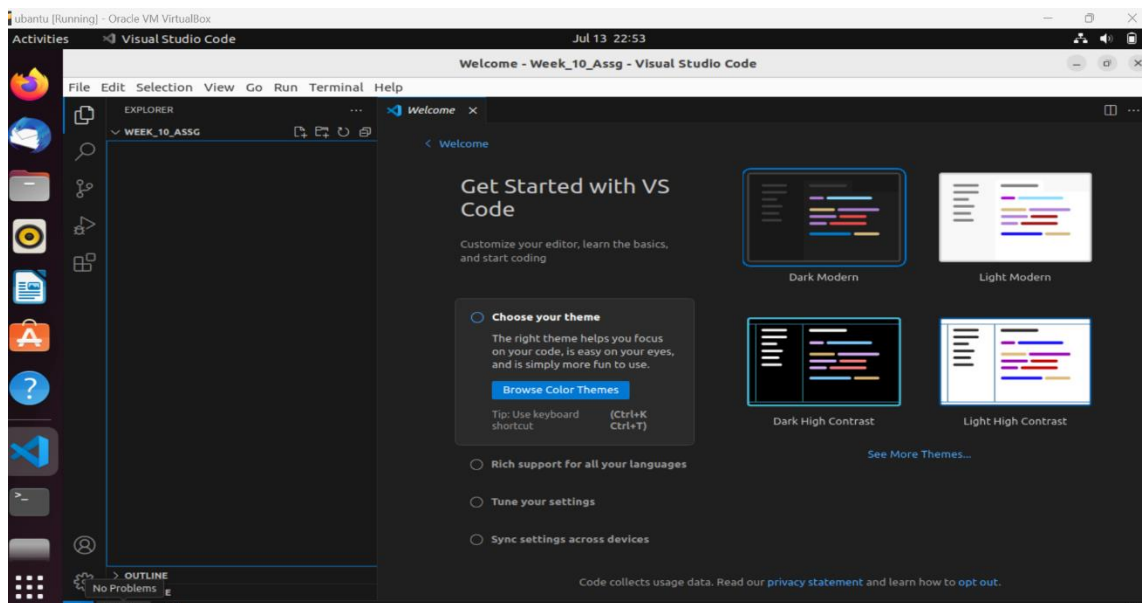




2. Set up Visual Studio code on Ubuntu VM.

Downloaded the VSCode file from <https://code.visualstudio.com/>

Used Terminal to install it.



3. Set up Python

Solution : Python is set up, please find below snap with python version

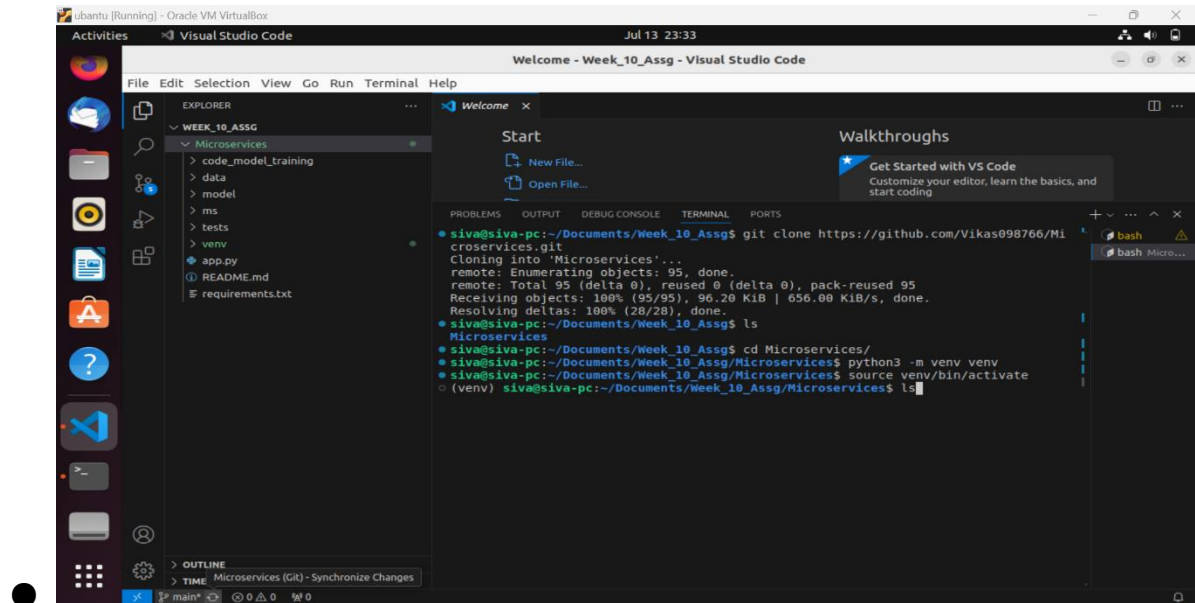
```
command 'python' from deb python3 python3
siva@siva-pc:~/Documents/Week_10_Assg/Microservices$ python3 --version
Python 3.10.12
siva@siva-pc:~/Documents/Week_10_Assg/Microservices$
```

4. Clone this Github repository

<https://github.com/Vikas098766/Microservices.git>

Solution : Cloned using the command

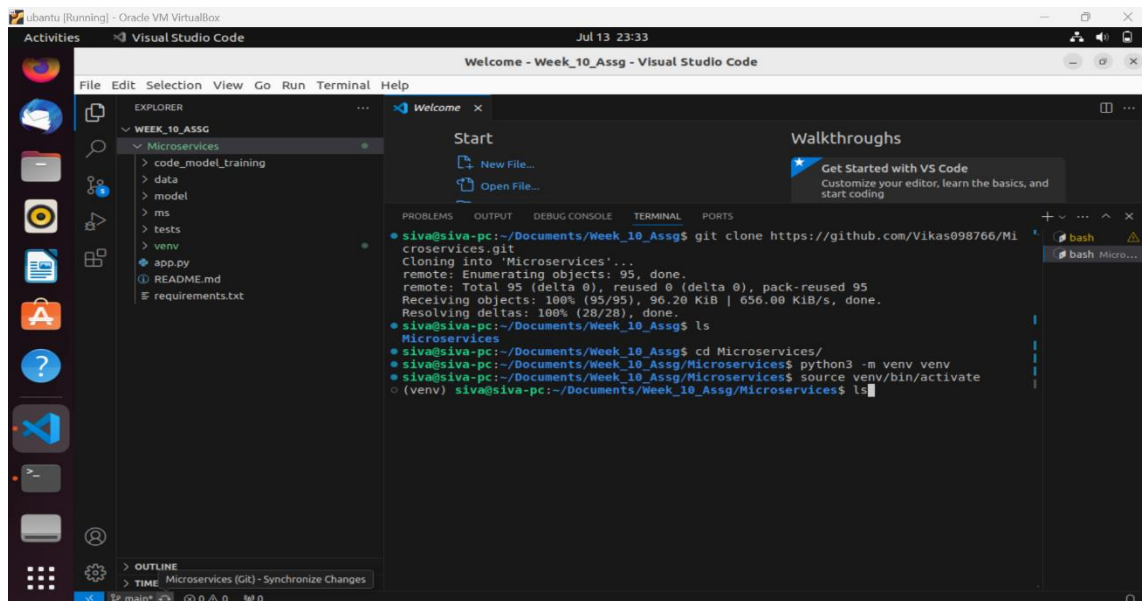
● `git clone https://github.com/Vikas098766/Microservices.git`



5. Create a Virtual Environment.

Solution : Created Virtual Environment using commands

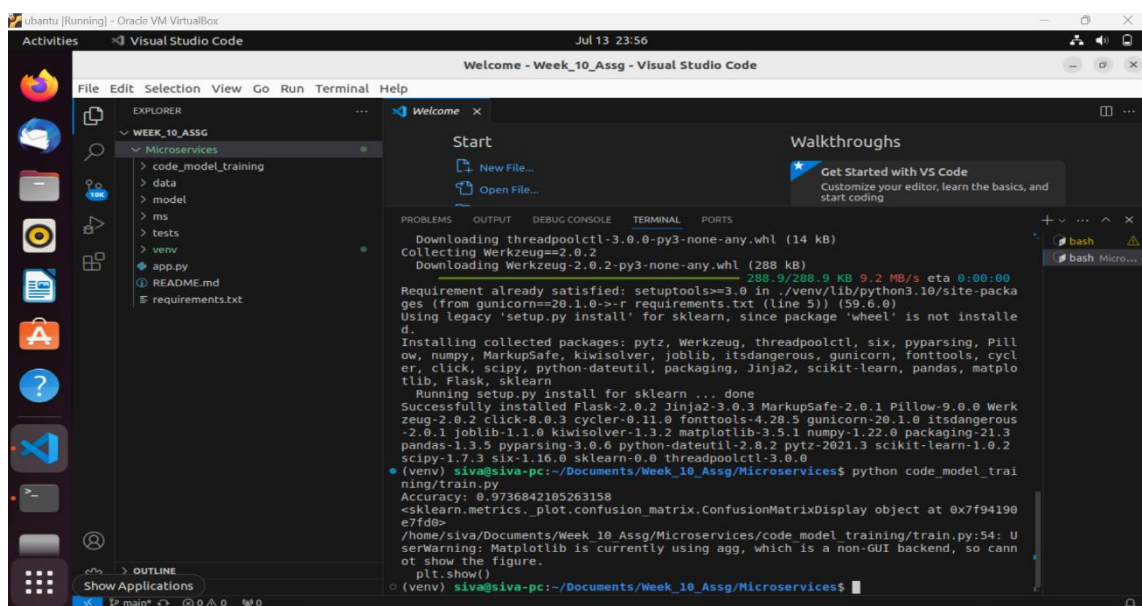
- `python3 -m venv venv`
- `source venv/bin/activate`



6. Install the dependencies from requirements.txt file.

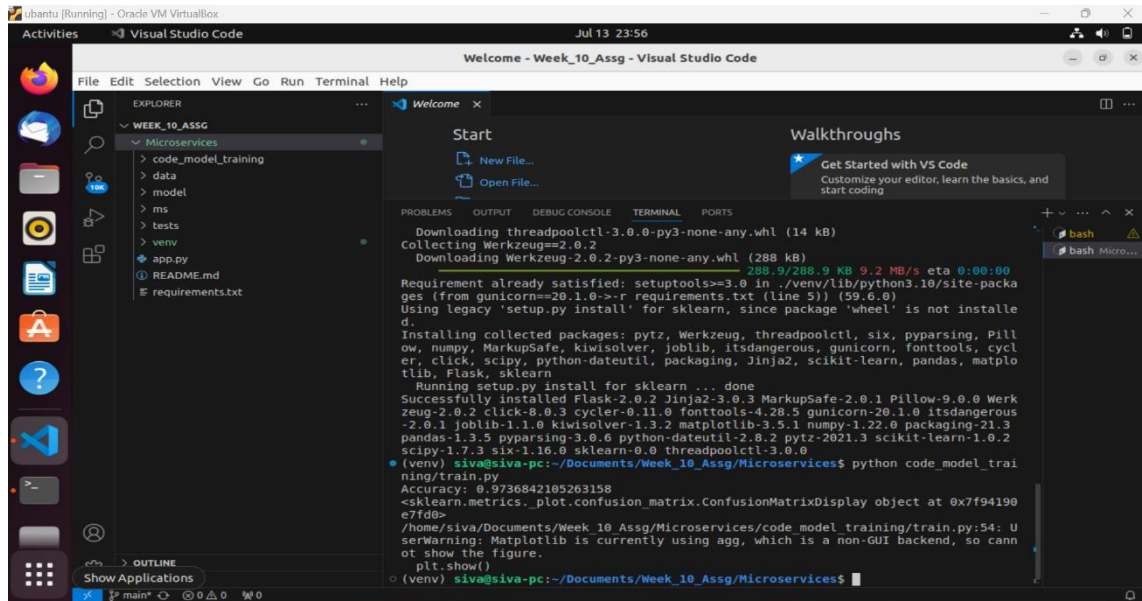
Solution : Installed all dependencies present in requirements.txt file using the command

- `pip install -r requirements.txt`



7. Train and save the model.

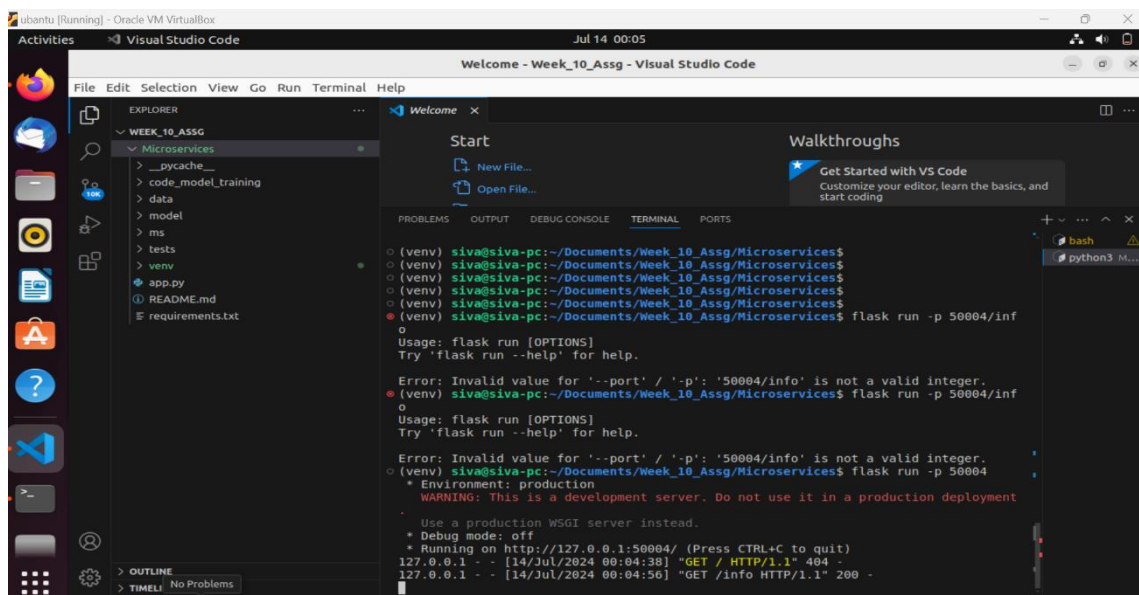
Solution : Trained and saved the model. ● Command: `python code_model_training/train.py`



8. Test the Flask web application.

Solution : Tested web application by running the command.

- flask run -p 5000



9: Tested the the end point /info Command: curl -X GET

http://localhost:5000/info Command: curl -X GET

<http://localhost:5000/health>


```

Command USED: curl-d '[{"radius_mean": 17.99, "texture_mean": 10.38,
"perimeter_mean": 122.8, "area_mean": 1001.0, "smoothness_mean":
0.1184, "compactness_mean": 0.2776, "concavity_mean": 0.3001,
"concave points_mean": 0.1471, "symmetry_mean": 0.2419,
"fractal_dimension_mean": 0.07871, "radius_se": 1.095, "texture_se":
0.9053, "perimeter_se": 8.589, "area_se": 153.4, "smoothness_se":
0.006399, "compactness_se": 0.04904, "concavity_se": 0.05373,
"concave points_se": 0.01587, "symmetry_se": 0.03003,
"fractal_dimension_se": 0.006193, "radius_worst": 25.38,
"texture_worst": 17.33, "perimeter_worst": 184.6, "area_worst":
2019.0, "smoothness_worst": 0.1622, "compactness_worst": 0.6656,
"concavity_worst": 0.7119, "concave points_worst": 0.2654,
"symmetry_worst": 0.4601, "fractal_dimension_worst": 0.1189}]]' \-H
"Content-Type: application/json" \-X POST http://0.0.0.0:5000/predict

```

```

siva@siva-pc: ~/Documents/Week_10_Assg/Microservices
siva@siva-pc: ~/Documents/Week_10_Assg/Microservices
siva@siva-pc: ~/Documents/Week_10_Assg/Microservices$ curl-d '[{"radius_mean": 17.99, "texture_mean": 10.38, "perimeter_mean": 122.8,
"area_mean": 1001.0, "smoothness_mean":
0.1184, "compactness_mean": 0.2776, "concavity_mean": 0.3001,
"concave points_mean": 0.1471, "symmetry_mean": 0.2419,
"fractal_dimension_mean": 0.07871, "radius_se": 1.095, "texture_se":
0.9053, "perimeter_se": 8.589, "area_se": 153.4, "smoothness_se":
0.006399, "compactness_se": 0.04904, "concavity_se": 0.05373,
"concave points_se": 0.01587, "symmetry_se": 0.03003,
"fractal_dimension_se": 0.006193, "radius_worst": 25.38,
"texture_worst": 17.33, "perimeter_worst": 184.6, "area_worst":
2019.0, "smoothness_worst": 0.1622, "compactness_worst": 0.6656,
"concavity_worst": 0.7119, "concave points_worst": 0.2654,
"symmetry_worst": 0.4601, "fractal_dimension_worst": 0.1189}]]' \
-H "Content-Type: application/json" \
-X POST http://0.0.0.0:5000/predict
curl-d: command not found
siva@siva-pc: ~/Documents/Week_10_Assg/Microservices$ curl -d '[{"radius_mean": 17.99, "texture_mean": 10.38, "perimeter_mean": 122.8,
"area_mean": 1001.0, "smoothness_mean":
0.1184, "compactness_mean": 0.2776, "concavity_mean": 0.3001,
"concave points_mean": 0.1471, "symmetry_mean": 0.2419,
"fractal_dimension_mean": 0.07871, "radius_se": 1.095, "texture_se":
0.9053, "perimeter_se": 8.589, "area_se": 153.4, "smoothness_se":
0.006399, "compactness_se": 0.04904, "concavity_se": 0.05373,
"concave points_se": 0.01587, "symmetry_se": 0.03003,
"fractal_dimension_se": 0.006193, "radius_worst": 25.38,
"texture_worst": 17.33, "perimeter_worst": 184.6, "area_worst":
2019.0, "smoothness_worst": 0.1622, "compactness_worst": 0.6656,
"concavity_worst": 0.7119, "concave points_worst": 0.2654,
"symmetry_worst": 0.4601, "fractal_dimension_worst": 0.1189}]]' \
-H "Content-Type: application/json" \
-X POST http://0.0.0.0:5000/predict
{"label": "M", "prediction": 1, "status": 200}
siva@siva-pc: ~/Documents/Week_10_Assg/Microservices$

```

API ENDPOINT with /predict got the output as
 { "label" : " M", " prediction" :1, " status" :200}

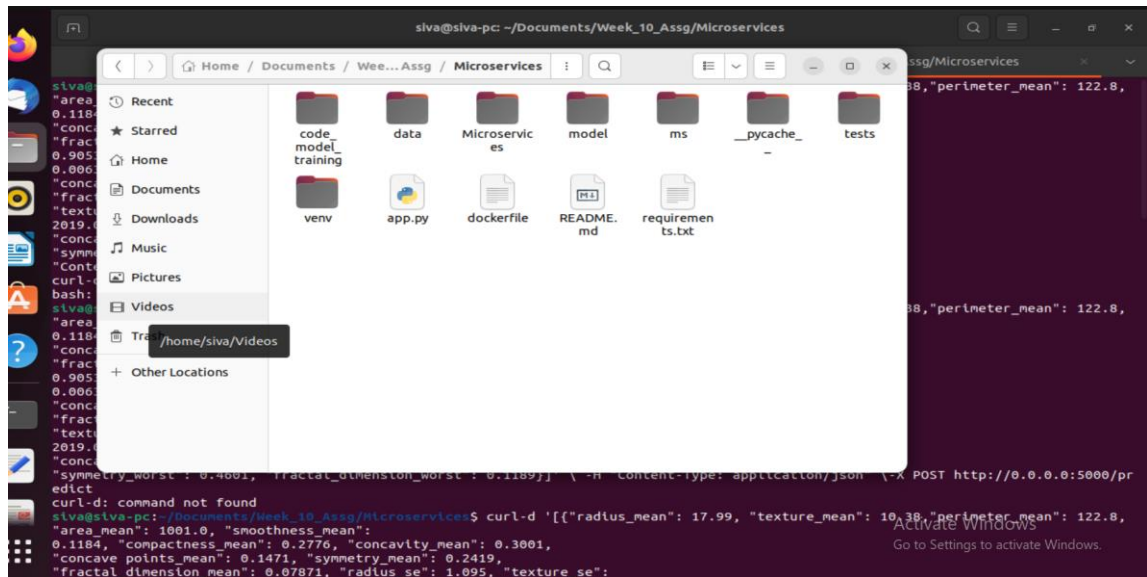
10. Steps to create a docker image.

1. Created the text file named dockerfile using the command as touch dockerfile

```

jahnnavi@jahnnavi-VirtualBox: ~/Documents/W11 Assignment/Microservices$ touch dockerfile
jahnnavi@jahnnavi-VirtualBox: ~/Documents/W11 Assignment/Microservices$

```

2. Within the txt file adding the following content within it.

```

• dockerfile
~/Documents/W11 Assignment/Microservices

# Use an official Python runtime as a parent image
FROM python:3.9-slim

# Set the working directory inside the container
WORKDIR /usr/src/app

# Copy the requirements file into the container
COPY requirements.txt ./

# Install dependencies
RUN pip install --no-cache-dir -r requirements.txt

# Copy the rest of the application code into the container
COPY . .

# Expose the port the app runs on
EXPOSE 5000

# Define the command to run the app
CMD ["flask", "run", "--host=0.0.0.0", "--port=5000"]

```

3. Build the docker image with the name as my-python-app

- Command: `sudo docker build -t my-python-app .`

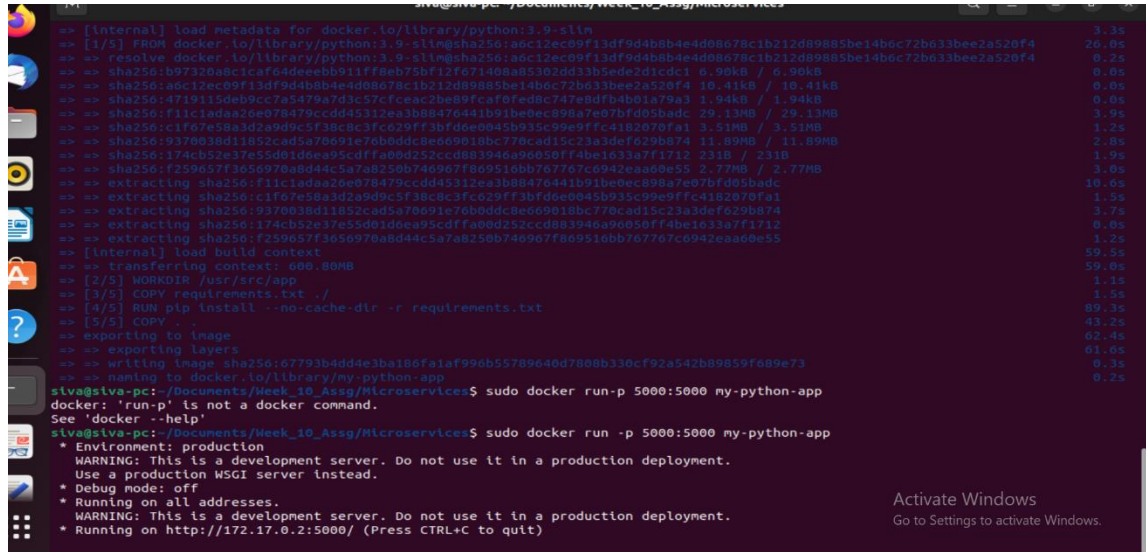
```
set1.socket.bind(set1.server_address)
OSError: [Errno 98] Address already in use
siva@siva-pc:~/Documents/Week_10_Assg/Microservices$ docker --version
Docker version 24.0.5, build ced0996
siva@siva-pc:~/Documents/Week_10_Assg/Microservices$
```

```
Activities Terminal Jul 21 16:01 siva@siva-pc: ~/Documents/Week_10_Assg/Microservices

siva@siva-pc:~/Documents/Week_10_Assg/Microservices$ sudo snap install docker
docker 24.0.5 from Canonical** installed
siva@siva-pc:~/Documents/Week_10_Assg/Microservices$ docker --version
Docker version 24.0.5, build ced0996
siva@siva-pc:~/Documents/Week_10_Assg/Microservices$ sudo docker build -t my-python-app .
[+] Building 229.6s (9/10) docker:default
=> [internal] load build definition from Dockerfile 0.5s
=> => transferring Dockerfile: 538B 0.0s
=> [internal] load .dockerignore 0.4s
=> => transferring context: 20 0.0s
=> [internal] load metadata for docker.io/library/python:3.9-slim 3.3s
=> [1/5] FROM docker.io/library/python:3.9-slim@sha256:a6c12ec09f13df9d4b8b4e4d08678c1b212d89885be14b6c72b633bee2a520f4 26.0s
=> => resolve docker.io/library/python:3.9-slim@sha256:a6c12ec09f13df9d4b8b4e4d08678c1b212d89885be14b6c72b633bee2a520f4 0.2s
=> => sha256:b97320a8c1cafe4deeebb911ff8eb75bf12f671408a85302dd33b5ede2d1cdc1 6.90kB / 6.90kB 0.0s
=> => sha256:a6c12ec09f13df9d4b8b4e4d08678c1b212d89885be14b6c72b633bee2a520f4 10.41kB / 10.41kB 0.0s
=> => sha256:4719115deb9cc7a5479a7d3c57cfceac2be89fcaf0fed8c747e8dfb4b01a79a3 1.94kB / 1.94kB 0.0s
=> => sha256:f11c1adaa26e078479ccdd45312ea3b88476441b91beec898a7e07bf0d5badc 29.13MB / 29.13MB 3.9s
=> => sha256:c1f67e58a3d2a9d9c5f38c8c3fc629ff3bfd6e0845b935c99e9ffc4182870fa1 1.5s / 1.5s 1.2s
=> => sha256:9370038d11852cad5a70691e70b0ddc8e669018bc770cad15c23a3def629b874 11.89MB / 11.89MB 2.8s
=> => sha256:174cb52e37e55d81d6ea95cdfa0d252ccd88394a9a0e05ff4be1633a7f1712 231B / 231B 1.9s
=> => sha256:f259657f3658970a8d44c5a7a8250b746967f869516bb767767c6942eaa0e55 2.77MB / 2.77MB 3.0s
=> => extracting sha256:f11c1adaa26e078479ccdd45312ea3b88476441b91beec898a7e07bf0d5badc 10.6s
=> => extracting sha256:c1f67e58a3d2a9d9c5f38c8c3fc629ff3bfd6e0845b935c99e9ffc4182870fa1 1.5s
=> => extracting sha256:9370038d11852cad5a70691e70b0ddc8e669018bc770cad15c23a3def629b874 3.7s
=> => extracting sha256:174cb52e37e55d81d6ea95cdfa0d252ccd88394a9a0e05ff4be1633a7f1712 0.0s
=> [internal] load build context 1.2s
=> => transferring context: 600.80MB 59.5s
=> [2/5] WORKDIR /usr/src/app 59.0s
=> [3/5] COPY requirements.txt ./ 1.1s
=> [4/5] RUN pip install --no-cache-dir -r requirements.txt 1.5s
=> [5/5] RUN pip install --no-cache-dir -r requirements.txt 89.3s
=> => exporting to image 30.2s
=> => exporting layers 30.2s
```

4. Run the Docker Container

- Command: `sudo docker run -p 5000:5000 my-python-app`

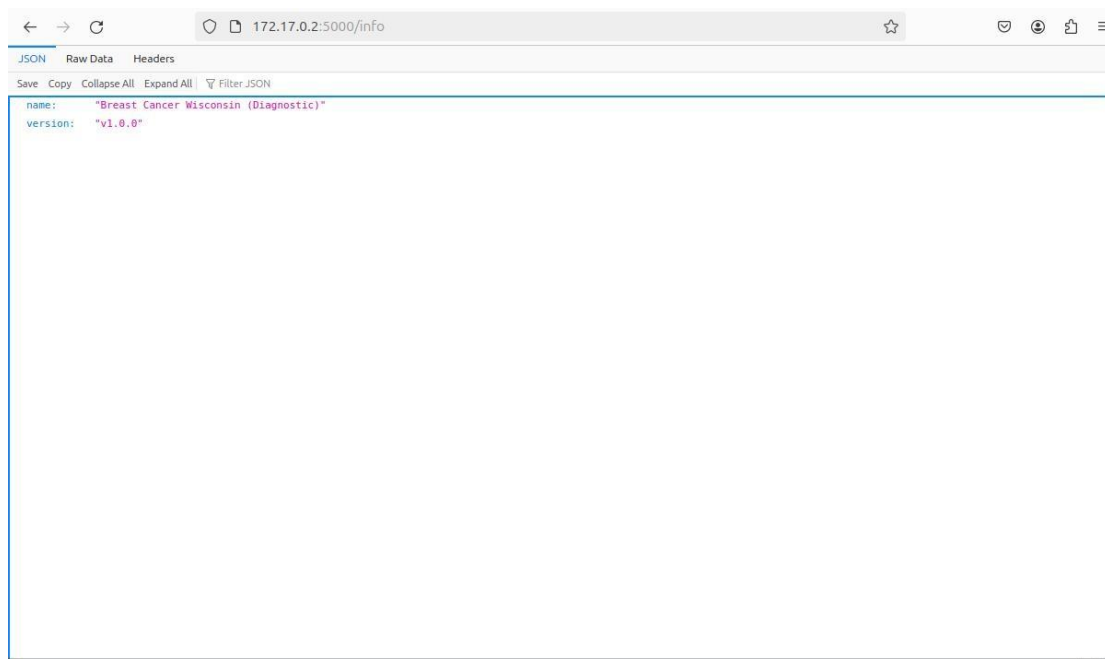


The terminal shows the Docker build process for the 'my-python-app' image. It starts with an internal metadata load, followed by a FROM statement for the python:3.9-slim base image. The build proceeds through several layers, including resolving the base image, adding requirements, and installing dependencies. The final step is running the container with the command `sudo docker run -p 5000:5000 my-python-app`. The output shows the container is running on port 5000, and the application is a development server.

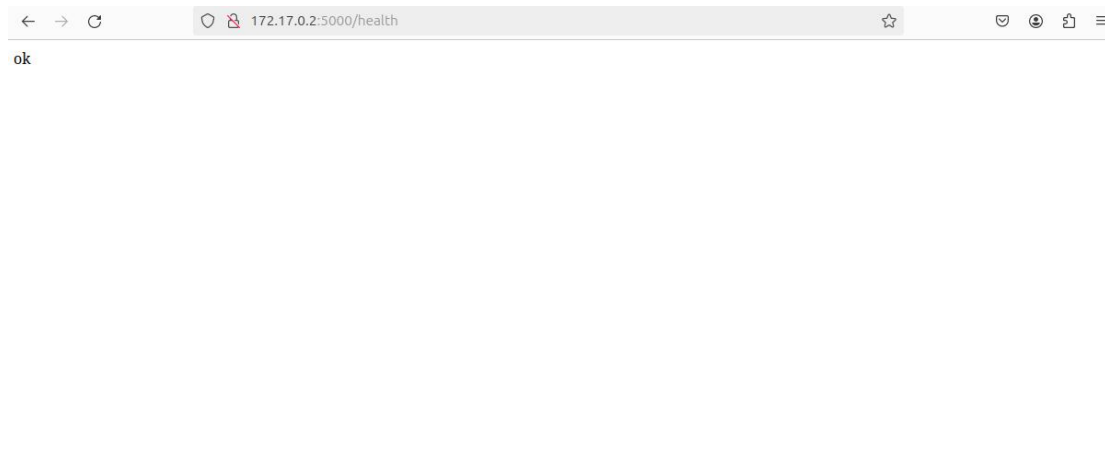
```
=> [internal] load metadata for docker.io/library/python:3.9-slim
=> [1/5] FROM docker.io/library/python:3.9-slim
=> resolve docker.io/library/python:3.9-slim
=> sha256:b97326a8c1a644e4d88678c1b212d89885be14b6c72b633bee2a520f4 8.25
=> sha256:a6c12ec09f13df9d4b8b4e4d88678c1b212d89885be14b6c72b633bee2a520f4 6.90kB / 6.90kB
=> sha256:a6c12ec09f13df9d4b8b4e4d88678c1b212d89885be14b6c72b633bee2a520f4 10.41kB / 10.41kB
=> sha256:4719115deb9cc7a5479a7d3c57cfeac2be89fca0fed8c747e8dfb4b01a79a3 1.94kB / 1.94kB
=> sha256:f11c1adaa26e078479ccdd45312ea3b88476441b91be0ec898a7e07bdf05badc 29.13MB / 29.13MB
=> sha256:c1f67e58a3d2a9d9c5f38c8c3fc629ff3b7d0e0045b935c99e9ffc4182070fa1 3.51MB / 3.51MB
=> sha256:937003bd11852cad5a70691e70b0ddc8e669018bc770cad15c23a3def629b874 11.89MB / 11.89MB
=> sha256:174cb52e37e55d01d0ea95cdfa00d252ccd88394a9e050ff4be1633a7f1712 231B / 231B
=> sha256:f259657f3656970a8d44c5a7a8250b746967f869510bb767767c6942eaa60e55 2.77MB / 2.77MB
=> extracting sha256:f11c1adaa26e078479ccdd45312ea3b88476441b91be0ec898a7e07bdf05badc 10.6s
=> extracting sha256:c1f67e58a3d2a9d9c5f38c8c3fc629ff3b7d0e0045b935c99e9ffc4182070fa1 1.5s
=> extracting sha256:937003bd11852cad5a70691e70b0ddc8e669018bc770cad15c23a3def629b874 3.7s
=> extracting sha256:174cb52e37e55d01d0ea95cdfa00d252ccd88394a9e050ff4be1633a7f1712 0.0s
=> extracting sha256:f259657f3656970a8d44c5a7a8250b746967f869510bb767767c6942eaa60e55 1.2s
=> [internal] load build context
=> transferring context: 600.80MB
=> [2/5] WORKDIR /usr/src/app
=> [3/5] COPY requirements.txt ./
=> [4/5] RUN pip install --no-cache-dir -r requirements.txt
=> [5/5] COPY . .
=> exporting to image
=> exporting layers
=> writing image sha256:67793b4dd4e3ba18d6fa1f996b55789640d7808b330cf92a542b89859f689e73
=> naming to docker.io/library/my-python-app
siva@siva-pc: /Documents/Week_10_Assg/Microservices$ sudo docker run -p 5000:5000 my-python-app
docker: 'run-p' is not a docker command.
See 'docker --help'
siva@siva-pc: /Documents/Week_10_Assg/Microservices$ sudo docker run -p 5000:5000 my-python-app
* Environment: production
WARNING: This is a development server. Do not use it in a production deployment.
Use a production WSGI server instead.
* Debug mode: off
* Running on all addresses.
WARNING: This is a development server. Do not use it in a production deployment.
* Running on http://172.17.0.2:5000/ (Press CTRL+C to quit)
```

11. To check the Docker image service locally with the help of POSTMAN end points as

1. /info



2. /health



3. /predict

```
siva@siva-pc: ~/Documents/Week_10_Assg/Microservices
siva@siva-pc: ~/Documents/Week_10_Assg/Microservices$ curl -d '{"radius_mean": 17.99, "texture_mean": 10.38, "perimeter_mean": 122.8, "area_mean": 1001.0, "smoothness_mean": 0.1184, "compactness_mean": 0.2776, "concavity_mean": 0.3001, "concave_points_mean": 0.1471, "symmetry_mean": 0.2419, "fractal_dimension_mean": 0.07871, "radius_se": 1.095, "texture_se": 0.9053, "perimeter_se": 8.589, "area_se": 153.4, "smoothness_se": 0.006399, "compactness_se": 0.04904, "concavity_se": 0.05373, "concave_points_se": 0.01587, "symmetry_se": 0.03803, "fractal_dimension_se": 0.006193, "radius_worst": 25.38, "texture_worst": 17.33, "perimeter_worst": 184.6, "area_worst": 2019.0, "smoothness_worst": 0.1622, "compactness_worst": 0.6656, "concavity_worst": 0.7119, "concave_points_worst": 0.2654, "symmetry_worst": 0.4601, "fractal_dimension_worst": 0.1189}]' -H "Content-Type: application/json" -X POST http://0.0.0.0:5000/predict
curl: command not found
siva@siva-pc: ~/Documents/Week_10_Assg/Microservices$ curl -d '{"radius_mean": 17.99, "texture_mean": 10.38, "perimeter_mean": 122.8, "area_mean": 1001.0, "smoothness_mean": 0.1184, "compactness_mean": 0.2776, "concavity_mean": 0.3001, "concave_points_mean": 0.1471, "symmetry_mean": 0.2419, "fractal_dimension_mean": 0.07871, "radius_se": 1.095, "texture_se": 0.9053, "perimeter_se": 8.589, "area_se": 153.4, "smoothness_se": 0.006399, "compactness_se": 0.04904, "concavity_se": 0.05373, "concave_points_se": 0.01587, "symmetry_se": 0.03803, "fractal_dimension_se": 0.006193, "radius_worst": 25.38, "texture_worst": 17.33, "perimeter_worst": 184.6, "area_worst": 2019.0, "smoothness_worst": 0.1622, "compactness_worst": 0.6656, "concavity_worst": 0.7119, "concave_points_worst": 0.2654, "symmetry_worst": 0.4601, "fractal_dimension_worst": 0.1189}]' -H "Content-Type: application/json" -X POST http://0.0.0.0:5000/predict
curl: command not found
siva@siva-pc: ~/Documents/Week_10_Assg/Microservices$ curl -d '{"radius_mean": 17.99, "texture_mean": 10.38, "perimeter_mean": 122.8, "area_mean": 1001.0, "smoothness_mean": 0.1184, "compactness_mean": 0.2776, "concavity_mean": 0.3001, "concave_points_mean": 0.1471, "symmetry_mean": 0.2419, "fractal_dimension_mean": 0.07871, "radius_se": 1.095, "texture_se": 0.9053, "perimeter_se": 8.589, "area_se": 153.4, "smoothness_se": 0.006399, "compactness_se": 0.04904, "concavity_se": 0.05373, "concave_points_se": 0.01587, "symmetry_se": 0.03803, "fractal_dimension_se": 0.006193, "radius_worst": 25.38, "texture_worst": 17.33, "perimeter_worst": 184.6, "area_worst": 2019.0, "smoothness_worst": 0.1622, "compactness_worst": 0.6656, "concavity_worst": 0.7119, "concave_points_worst": 0.2654, "symmetry_worst": 0.4601, "fractal_dimension_worst": 0.1189}]' -H "Content-Type: application/json" -X POST http://0.0.0.0:5000/predict
{"label": "M", "prediction": 1, "status": 200}
siva@siva-pc: ~/Documents/Week_10_Assg/Microservices$
```

