

## Installing VS code and Python 3 on VM

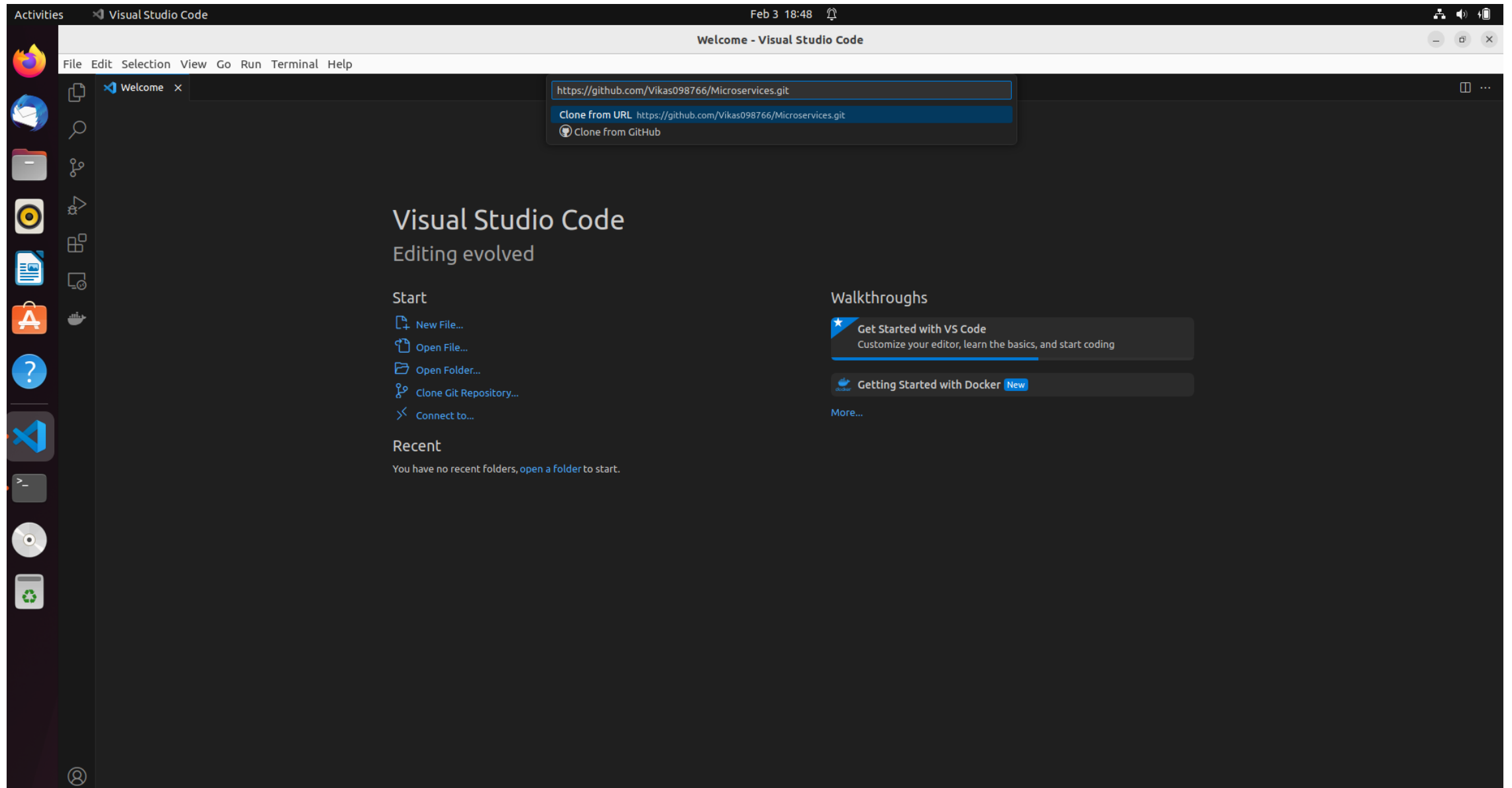
```
swapnil@swapnil-VirtualBox: ~  
swapnil@swapnil-VirtualBox:~$ sudo snap install --classic code  
code 05047486 from Visual Studio Code (vscode**) installed  
swapnil@swapnil-VirtualBox:~$
```

```
swapnil@swapnil-VirtualBox:~$ sudo apt install python3  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
The following packages were automatically installed and are no longer required:  
chromium-codecs-ffmpeg-extra gstreamer1.0-vaapi i965-va-driver  
intel-media-va-driver libaacs0 libaom3 libass9 libavcodec58 libavformat58  
libavutil56 libbdplus0 libblas3 libbluray2 libbs2b0 libchromaprint1  
libcodec2-1.0 libdav1d5 libflite1 libgme0 libgsm1  
libgstreamer-plugins-bad1.0-0 libigdgmm12 liblilv-0-0 libllvm15 libmfx1  
libmysofa1 libnorm1 libopenmpt0 libpgm-5.3-0 libpostproc55 librabbitmq4  
librubberband2 libserd-0-0 libshine3 libsnappy1v5 libsord-0-0 libsratom-0-0  
libsrt1.4-gnutls libssh-gcrypt-4 libswresample3 libswscale5 libudfread0  
libva-drm2 libva-wayland2 libva-x11-2 libva2 libvdpau1 libvidstab1.1  
libx265-199 libxvidcore4 libzimg2 libzmq5 libzvb-common libzvb0  
mesa-va-drivers mesa-va-drivers pocketsphinx-en-us systemd-hwe-hwdb  
va-driver-all vdpau-driver-all  
Use 'sudo apt autoremove' to remove them.  
The following additional packages will be installed:  
libpython3-stdlib libpython3.10 libpython3.10-minimal libpython3.10-stdlib  
python3-minimal python3.10 python3.10-minimal  
Suggested packages:  
python3-doc python3-tk python3-venv python3.10-venv python3.10-doc  
binfmt-support
```

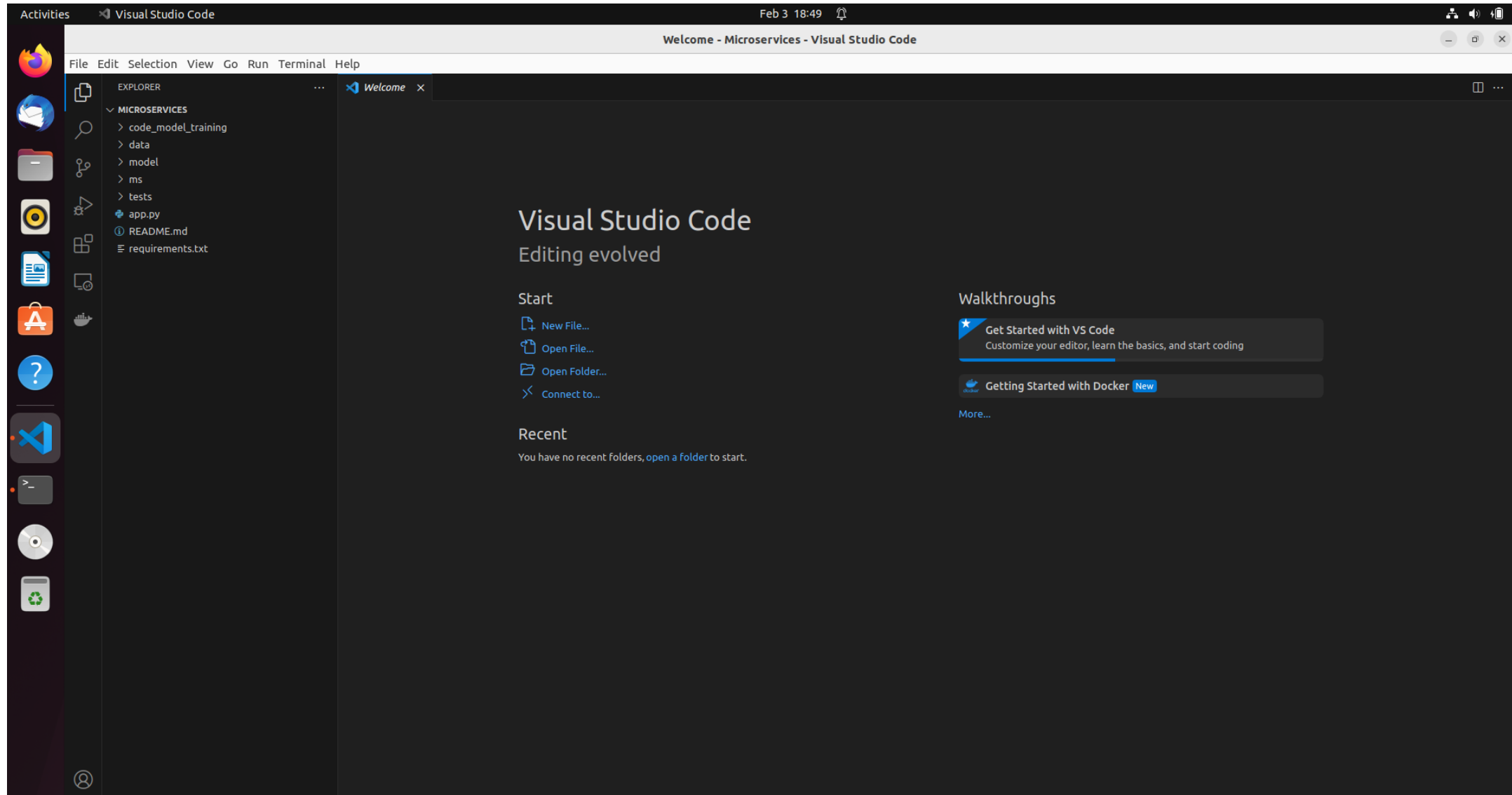
# Installing Git

```
Activities Terminal Feb 4 00:52 swapnil@swapnil-VirtualBox: ~
swapnil@swapnil-VirtualBox:~$ sudo apt update
[sudo] password for swapnil:
Hit:1 https://packages.microsoft.com/repos/code stable InRelease
Get:2 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Hit:3 http://in.archive.ubuntu.com/ubuntu jammy InRelease
Get:4 http://in.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Hit:5 http://in.archive.ubuntu.com/ubuntu jammy-backports InRelease
Get:6 http://in.archive.ubuntu.com/ubuntu jammy-updates/main i386 Packages [560 kB]
Get:7 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [1,325 kB]
Get:8 http://in.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages [1,042 kB]
Get:9 http://in.archive.ubuntu.com/ubuntu jammy-updates/universe i386 Packages [686 kB]
Fetched 3,842 kB in 7s (515 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
464 packages can be upgraded. Run 'apt list --upgradable' to see them.
swapnil@swapnil-VirtualBox:~$ update
Command 'update' not found, did you mean:
  command 'pupdate' from deb pbuilder-scripts (22)
  command 'uupdate' from deb devscripts (2.22.1ubuntu1)
  command 'zupdate' from deb zutils (1.11-1)
  command 'xupdate' from deb libxml-xupdate-libxml-perl (0.6.0-3.1)
  command 'lupdate' from deb qtchooser (66-2build1)
Try: sudo apt install <deb name>
swapnil@swapnil-VirtualBox:~$ sudo apt install git
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  chromium-codecs-ffmpeg-extra gstreamer1.0-vaapi i965-va-driver
  intel-media-va-driver libaac0 libaom3 libass9 libavcodec58 libavformat58
  libavutil56 libbdplus0 libblas3 libbluray2 libbs2b0 libchromaprint1
  libcodec2-1.0 libdav1d5 libflite1 libgme0 libgsm1
  libgstreamer-plugins-bad1.0-0 libigdgmm12 libllv-0-0 libllvm15 libnfx1
  libmysofa1 libnorm1 libopenmpt0 libpgm-5.3-0 libpostproc55 librabbitmq4
  librubberband2 libserd-0-0 libshine3 libsnappy1v5 libsord-0-0 libsratom-0-0
  libstr1.4-gnutls libssh-gcrypt-4 libswresample3 libswscale5 libudfread0
  libva-drm2 libva-wayland2 libva-x11-2 libva2 libvdpau1 libvidstab1.1
  libx265-199 libxvidcore4 libzimg2 libzmq5 libzvt-common libzvt0
  mesa-va-drivers mesa-vaapi-drivers pocketsphinx-en-us systemd-hwe-hwdb
  va-driver-all vdpau-driver-all
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  git-man liberror-perl
Suggested packages:
  git-daemon-run | git-daemon-sysvinit git-doc git-email git-gui gitk gitweb
  git-cvs git-mediawiki git-svn
The following NEW packages will be installed:
  git git-man liberror-perl
0 upgraded, 3 newly installed, 0 to remove and 464 not upgraded.
Need to get 4,147 kB of archives.
After this operation, 21.0 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 liberror-perl all 0.17029-1 [26.5 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 git-man all 1:2.34.1-1ubuntu1.10 [954 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 git amd64 1:2.34.1-1ubuntu1.10 [3,166 kB]
```

# VS code



# Pulling file from Git : Cloning repository



# Building Virtual Environment

☒ Show welcome page on startup

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

bash

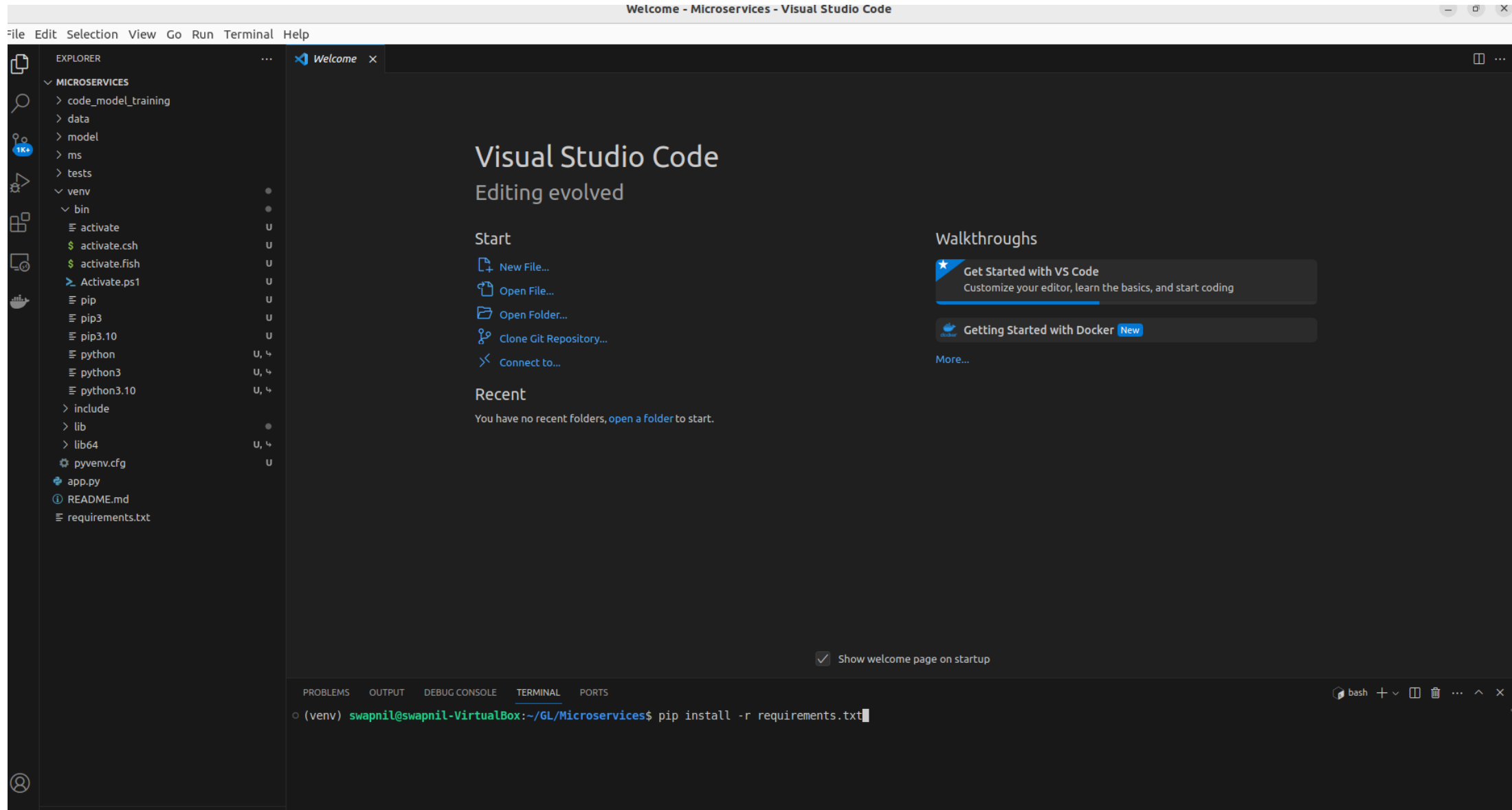
Preparing to unpack .../python3.10-venv\_3.10.12-1~22.04.3\_amd64.deb ...  
Unpacking python3.10-venv (3.10.12-1~22.04.3) ...  
Setting up python3-setuptools-whl (59.6.0-1.2ubuntu0.22.04.1) ...  
Setting up python3-pip-whl (22.0.2+dfsg-1ubuntu0.4) ...  
Setting up python3-lib2to3 (3.10.8-1~22.04) ...  
Setting up python3-distutils (3.10.8-1~22.04) ...  
Setting up python3.10-venv (3.10.12-1~22.04.3) ...  
○ swapnil@swapnil-VirtualBox:~/GL/Microservices\$

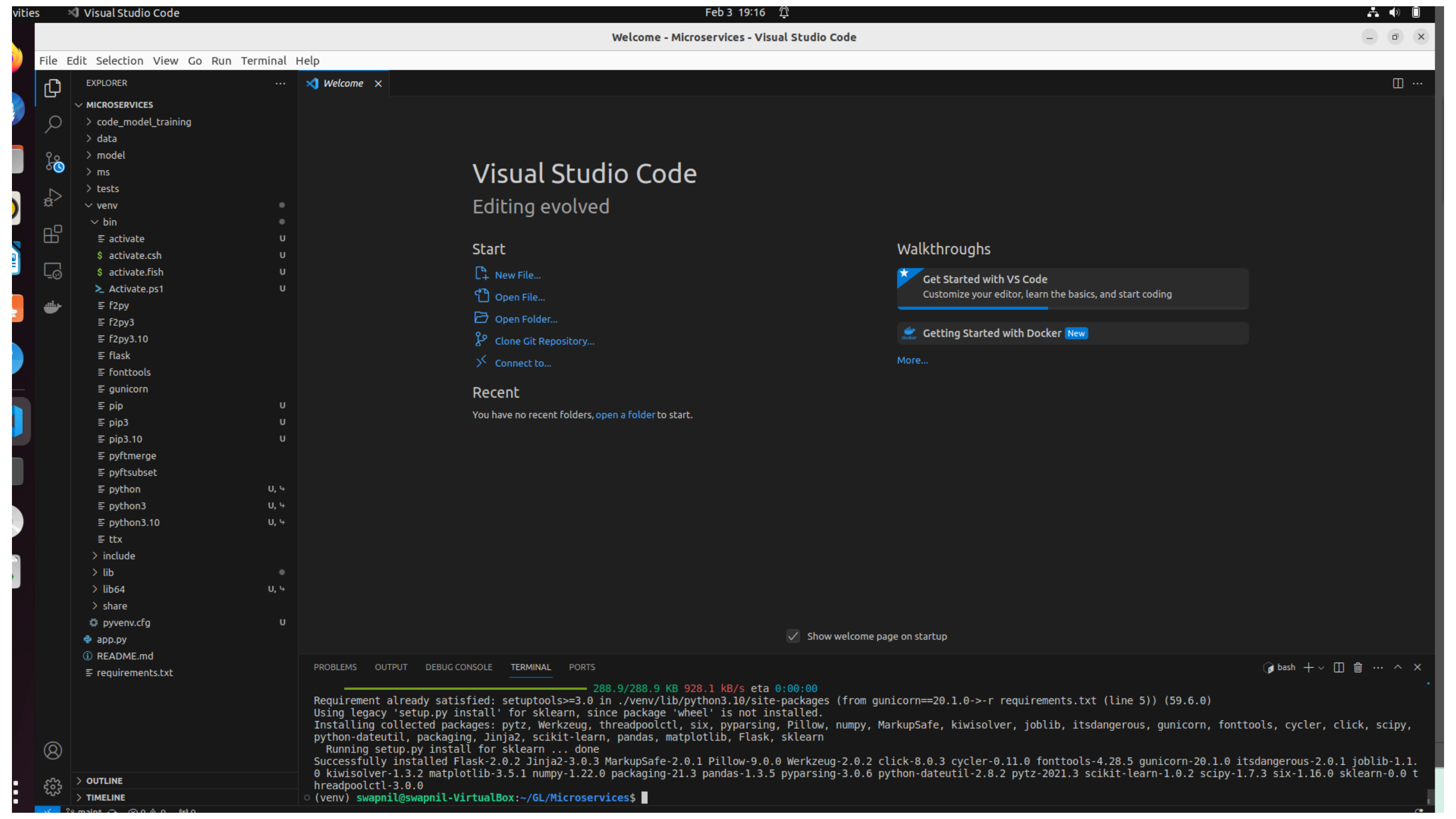
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

bash

bash: venv/bin/activate: No such file or directory  
○ swapnil@swapnil-VirtualBox:~/GL/Microservices\$ ^C  
⊗ swapnil@swapnil-VirtualBox:~/GL/Microservices\$ source  
bash: source: filename argument required  
source: usage: source filename [arguments]  
⊗ swapnil@swapnil-VirtualBox:~/GL/Microservices\$ source venv/bin/activate  
bash: venv/bin/activate: No such file or directory  
● swapnil@swapnil-VirtualBox:~/GL/Microservices\$ python3 -m venv venv  
● swapnil@swapnil-VirtualBox:~/GL/Microservices\$ source venv/bin/activate  
○ (venv) swapnil@swapnil-VirtualBox:~/GL/Microservices\$

# Running Requirements file





# Running Train.PY with accuracy of 97% (Train and Save the model)

```
code_model_training > train.py > ...
1  # Import packages
2  from sklearn.ensemble import VotingClassifier
3  from sklearn.model_selection import train_test_split
4  from sklearn.linear_model import LogisticRegression
5  from sklearn.tree import DecisionTreeClassifier
6  from sklearn.svm import SVC
7  from sklearn.preprocessing import MinMaxScaler
8  from sklearn.impute import SimpleImputer
9  from sklearn.pipeline import Pipeline
10 from sklearn.metrics import ConfusionMatrixDisplay
11 import matplotlib.pyplot as plt
12 import pandas as pd
13 import joblib
14 import gzip
15
16
17 # Load the dataset
18 data = pd.read_csv('data/breast_cancer.csv')
19
20 # Preprocess dataset
21 data = data.set_index('id')
22 del data['Unnamed: 32']
23 data['diagnosis'] = data['diagnosis'].replace(['B', 'M'], [0, 1]) # Encode y, B -> 0 , M -> 1
24
25 # Split into train and test set, 80%-20%
26 y = data.pop('diagnosis')
27 X = data
28 X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)
29
30 # Create an ensemble of 3 models
31 estimators = []
32 estimators.append(('logistic', LogisticRegression()))
33 estimators.append(('cart', DecisionTreeClassifier()))
34 estimators.append(('svm', SVC()))
35
36 # Create the Ensemble Model
37 ensemble = VotingClassifier(estimators)
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
/home/swapnil/GL/Microservices/venv/bin/python /home/swapnil/GL/Microservices/code_model_training/train.py
• (venv) swapnil@swapnil-VirtualBox:~/GL/Microservices$ /home/swapnil/GL/Microservices/venv/bin/python /home/swapnil/GL/Microservices/code_model_training/train.py
Accuracy: 0.9736842105263158
<sklearn.metrics._plot.confusion_matrix.ConfusionMatrixDisplay object at 0x7efec59dbfa0>
/home/swapnil/GL/Microservices/code_model_training/train.py:54: UserWarning: Matplotlib is currently using agg, which is a non-GUI backend, so cannot show the figure.
  plt.show()
○ (venv) swapnil@swapnil-VirtualBox:~/GL/Microservices$
```



# Testing Model

Ubuntu [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Activities Visual Studio Code Feb 12 08:36

app.py - Microservices - Visual Studio Code

File Edit Selection View Go Run Terminal Help

EXPLORER

- MICROSERVICES
  - code\_model\_training
    - data
      - breast\_cancer.csv
    - model
      - model\_binary.dat.gz
    - ms
      - \_\_pycache\_\_
      - \_\_init\_\_.py
      - functions.py
    - tests
      - example\_calls.txt
    - venv
      - bin
      - include
      - lib
      - lib64
      - share/man/man1
      - ttx.1
      - pyvenv.cfg
      - .dockerignore
      - app.py
      - Dockerfile
      - README.md
      - requirements.txt

OUTLINE

- app.py
  - File Saved 3 days
  - File Saved 1 wk
  - File Saved
  - Add Files via upload Vikas098766 1 yr

app.py

```
30 """Return service health"""
31 return 'ok'
32
33
34 @app.route('/predict', methods=['POST'])
35 def predict():
36     feature_dict = request.get_json()
37     if not feature_dict:
38         return {
39             'error': 'Body is empty.'
40         }, 500
41
42     try:
43         response = get_model_response(feature_dict)
44     except ValueError as e:
45         return {'error': str(e).split('\n')[-1].strip()}, 500
46
47     return response, 200
48
49
50 if __name__ == '__main__':
51     app.run(host='0.0.0.0', port=5000)
52
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

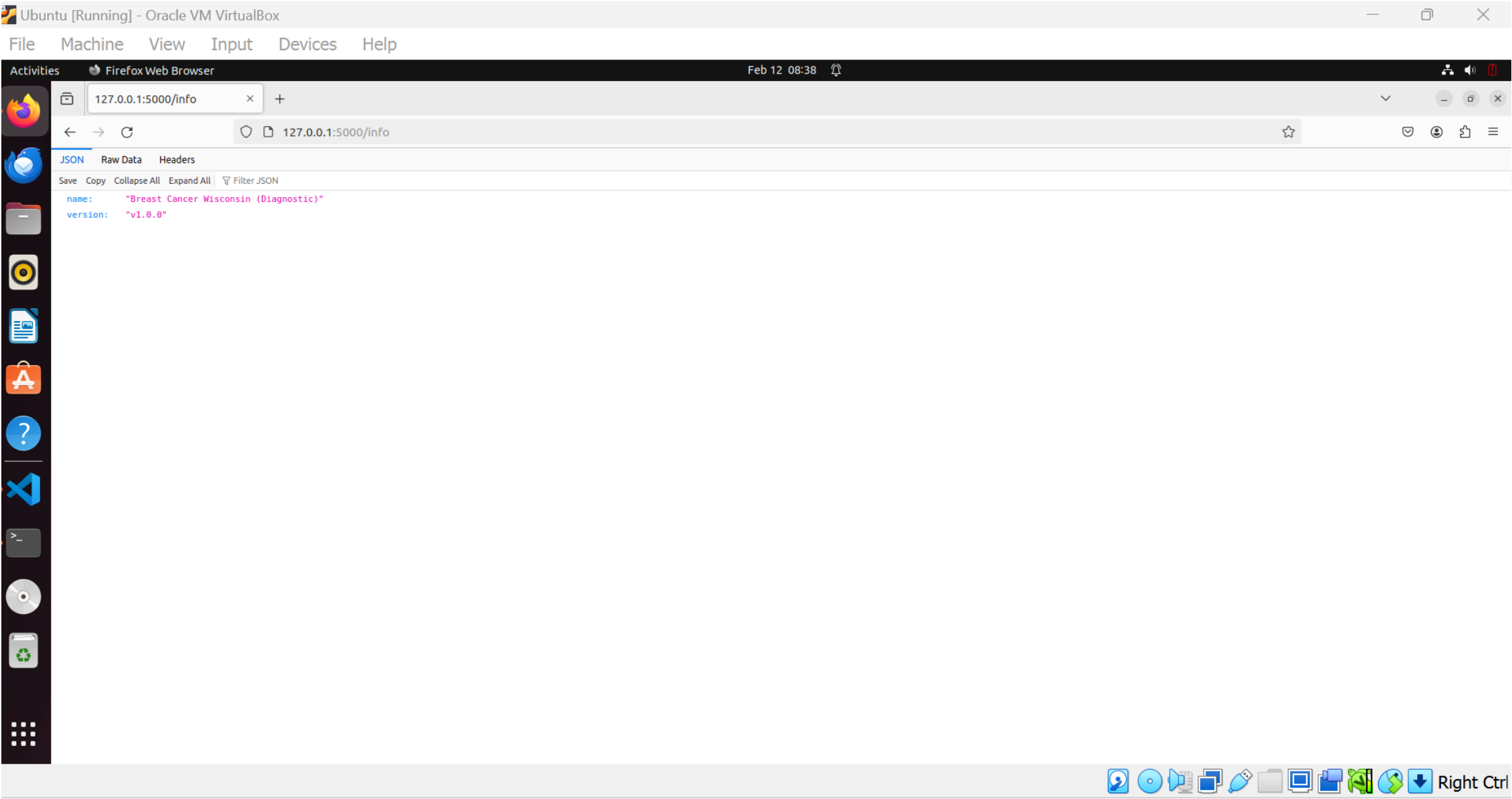
(venv) swapnil@swapnil-VirtualBox:~/GL/Microservices\$ /home/swapnil/GL/Microservices/venv/bin/python /home/swapnil/GL/Microservices/app.py

- \* Serving Flask app 'ms' (lazy loading)
- \* 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://10.0.2.15:5000/ (Press CTRL+C to quit)

Ln 33, Col 1 Spaces: 4 UTF-8 CRLF Python 3.10.12 (venv:venv)

Right Ctrl

# Testing Model : Provides Info



# Testing Model : Health

Ubuntu [Running] - Oracle VM VirtualBox

FileMachineViewInputDevicesHelp

ActivitiesFirefox Web BrowserFeb 12 08:38

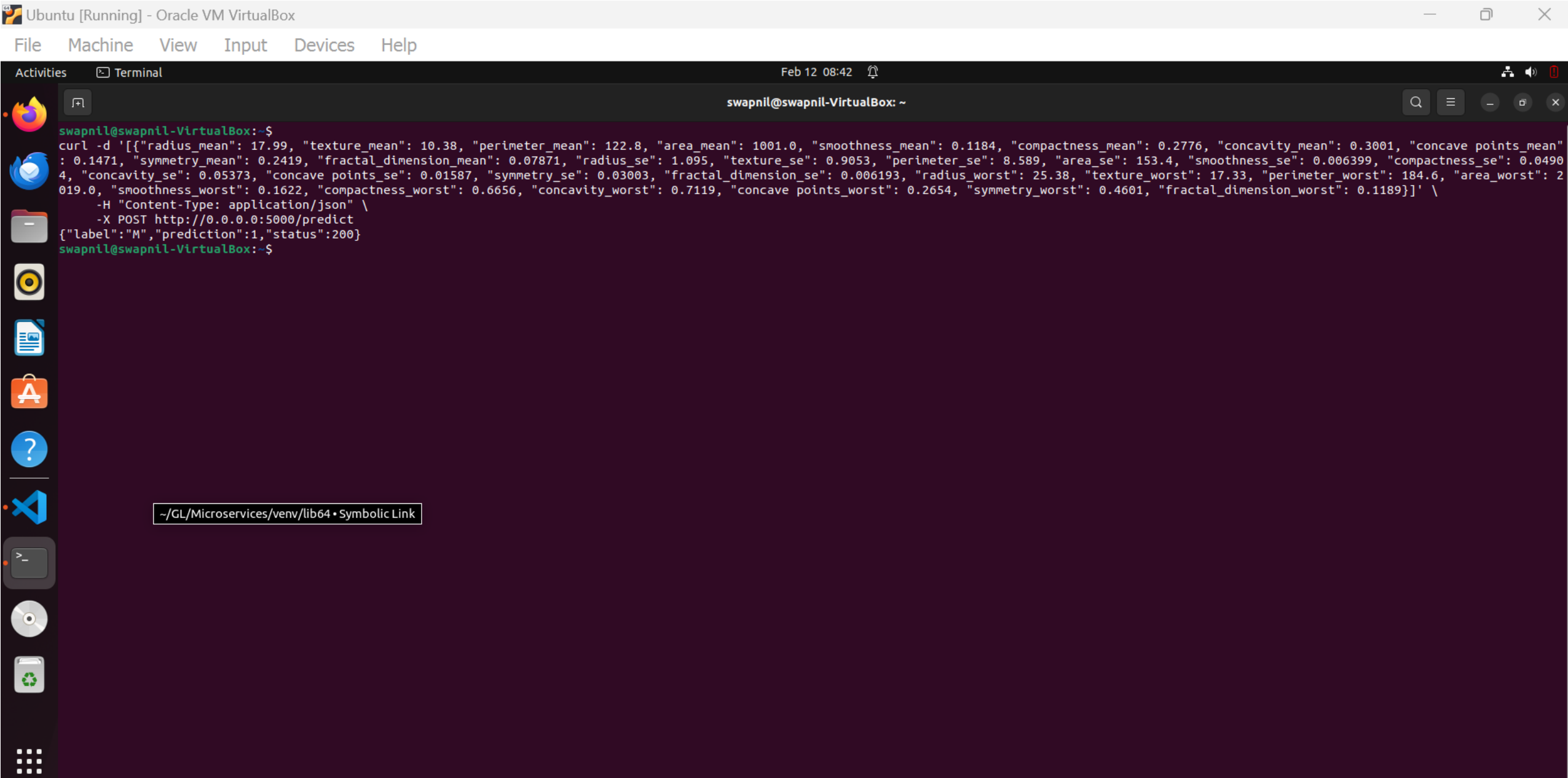
127.0.0.1:5000/health

127.0.0.1:5000/health

ok

Right Ctrl

# Testing Model : Using Curl



The screenshot shows a terminal window titled "swapnil@swapnil-VirtualBox: ~" with the following command and output:

```
swapnil@swapnil-VirtualBox:~$ 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}
```

The output of the curl command is a JSON object: `{"label": "M", "prediction": 1, "status": 200}`.

Below the terminal window, there is a status bar indicating the location of the symbolic link: `~/GL/Microservices/venv/lib64 • Symbolic Link`.

# Installing Docker : Downloading

```
Activities Terminal Feb 4 10:45 swapnil@swapnil-VirtualBox: ~/GL

swapnil@swapnil-VirtualBox:~/GL$ sudo apt-get update
Hit:1 https://download.docker.com/linux/ubuntu focal InRelease
Hit:2 https://packages.microsoft.com/repos/code stable InRelease
Hit:3 http://in.archive.ubuntu.com/ubuntu jammy InRelease
Hit:4 http://security.ubuntu.com/ubuntu jammy-security InRelease
Hit:5 http://in.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:6 http://in.archive.ubuntu.com/ubuntu jammy-backports InRelease
Reading package lists... Done
W: https://download.docker.com/linux/ubuntu/dists/focal/InRelease: Key is stored in legacy trusted.gpg keyring (/etc/apt/trusted.gpg), see the DEPRECATION section in apt-key(8) for details.
swapnil@swapnil-VirtualBox:~/GL$ sudo apt-get install docker-ce docker-ce-cli containerd.io
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
 chromium-codecs-ffmpeg-extra gstreamer1.0-vaapi i965-va-driver intel-media-va-driver libaacs0 libaom3 libass9 libavcodec58 libavformat58 libavutil56 libbdplus0 libblas3 libbluray2 libbs2b0
 libchromaprint1 libcodec2-1.0 libdavid5 libflashrom1 libflite1 libftdi1-2 libgme0 libgsm1 libgstreamer-plugins-bad1.0-0 libgdkmm12 libglv0-0 libllvmlib1 libmysofa1 libnorm1 libopenmpt0
 libpgm-5.3-0 libpostproc55 librabbitmq4 librubberband2 libserd-0-0 libshine3 libsnappy1v5 libsord-0-0 libsratom-0-0 libstr1.4-gnutls libssh-gcrypt-4 libswresample3 libswscale5 libudfread0 libva-drm2
 libva-wayland2 libva-x11-2 libva2 libvdpau1 libvidstab1.1 libx265-199 libxvidcore4 libzim2 libzmq5 libzvb-common libzvb0 mesa-va-drivers mesa-vdpau-drivers pocketsphinx-en-us va-driver-all
 vdpau-driver-all
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
 docker-buildx-plugin docker-ce-rootless-extras docker-compose-plugin libslirp0 pigz slirp4netns
Suggested packages:
 aufs-tools cgroupfs-mount | cgroup-lite
The following NEW packages will be installed:
 containerd.io docker-buildx-plugin docker-ce docker-ce-cli docker-ce-rootless-extras docker-compose-plugin libslirp0 pigz slirp4netns
0 upgraded, 9 newly installed, 0 to remove and 11 not upgraded.
Need to get 117 MB of archives.
After this operation, 420 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 https://download.docker.com/linux/ubuntu focal/stable amd64 containerd.io amd64 1.6.28-1 [29.6 MB]
Get:2 http://in.archive.ubuntu.com/ubuntu jammy/universe amd64 pigz amd64 2.6-1 [63.6 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 libslirp0 amd64 4.6.1-1build1 [61.5 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu jammy/universe amd64 slirp4netns amd64 1.0.1-2 [28.2 kB]
Get:5 https://download.docker.com/linux/ubuntu focal/stable amd64 docker-buildx-plugin amd64 0.12.1-1-ubuntu.20.04-focal [28.2 MB]
Get:6 https://download.docker.com/linux/ubuntu focal/stable amd64 docker-ce-cli amd64 5:25.0.2-1-ubuntu.20.04-focal [13.7 MB]
Get:7 https://download.docker.com/linux/ubuntu focal/stable amd64 docker-ce amd64 5:25.0.2-1-ubuntu.20.04-focal [24.3 MB]
Get:8 https://download.docker.com/linux/ubuntu focal/stable amd64 docker-ce-rootless-extras amd64 5:25.0.2-1-ubuntu.20.04-focal [9,323 kB]
Get:9 https://download.docker.com/linux/ubuntu focal/stable amd64 docker-compose-plugin amd64 2.24.5-1-ubuntu.20.04-focal [12.1 MB]
Fetched 117 MB in 35s (3,315 kB/s)
Selecting previously unselected package pigz.
(Reading database ... 205140 files and directories currently installed.)
Preparing to unpack .../0-pigz_2.6-1_amd64.deb ...
Unpacking pigz (2.6-1) ...
Selecting previously unselected package containerd.io.
Preparing to unpack .../1-containerd.io_1.6.28-1_amd64.deb ...
Unpacking containerd.io (1.6.28-1) ...
Selecting previously unselected package docker-buildx-plugin.
Preparing to unpack .../2-docker-buildx-plugin_0.12.1-1-ubuntu.20.04-focal_amd64.deb ...
Unpacking docker-buildx-plugin (0.12.1-1-ubuntu.20.04-focal) ...
Selecting previously unselected package docker-ce-cli.
Preparing to unpack .../3-docker-ce-cli_5%3a25.0.2-1-ubuntu.20.04-focal_amd64.deb ...
Unpacking docker-ce-cli (5:25.0.2-1-ubuntu.20.04-focal) ...
Selecting previously unselected package docker-ce.
Preparing to unpack .../4-docker-ce_5%3a25.0.2-1-ubuntu.20.04-focal_amd64.deb ...
Unpacking docker-ce (5:25.0.2-1-ubuntu.20.04-focal) ...
```

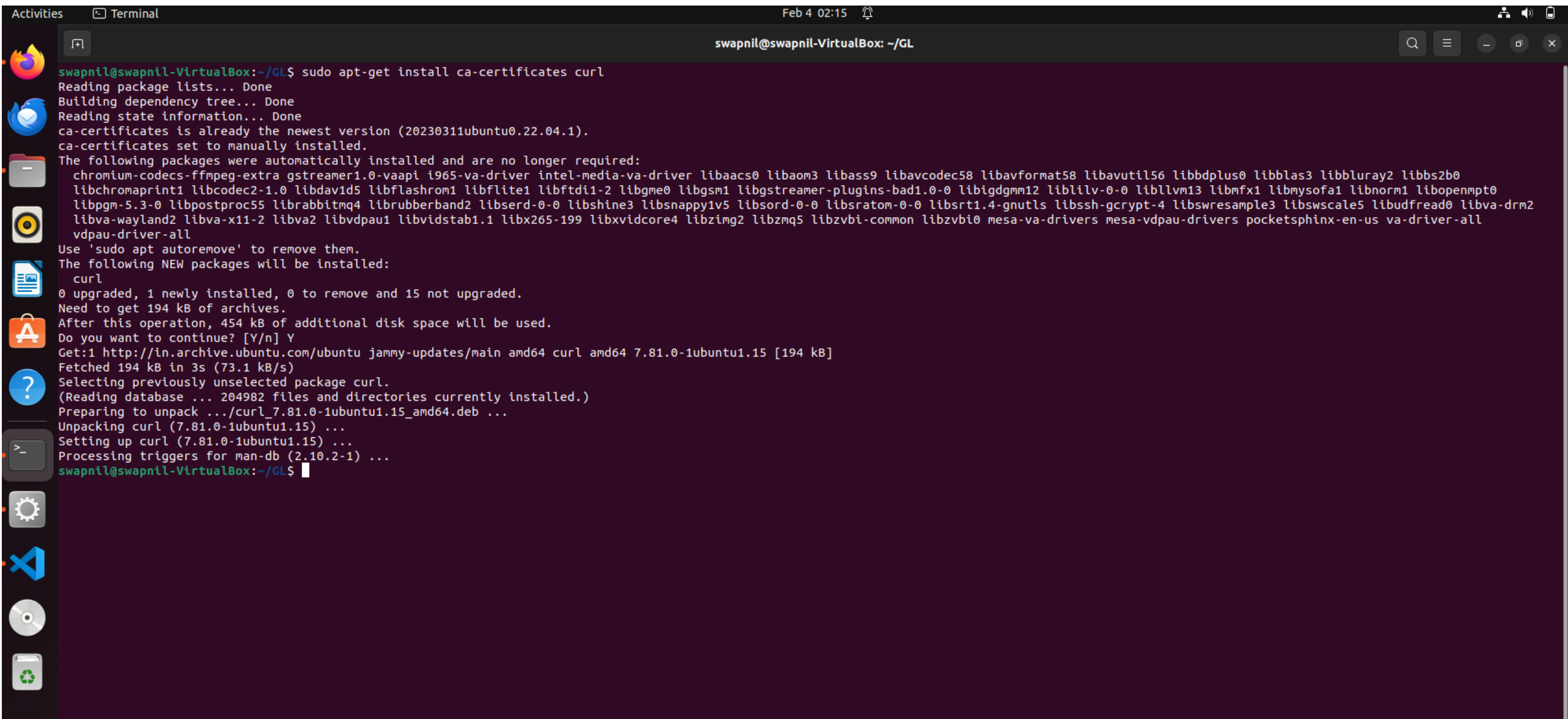
# Installing Docker : Installation

```
Activities Terminal Feb 4 10:46 swapnil@swapnil-VirtualBox: ~/GL

swapnil@swapnil-VirtualBox:~/GL$ sudo apt-get install ./docker-desktop-4.27.1-amd64.deb
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Note, selecting 'docker-desktop' instead of './docker-desktop-4.27.1-amd64.deb'
The following packages were automatically installed and are no longer required:
chromium-codecs-ffmpeg-extra gstreamer1.0-vaapi i965-va-driver intel-media-va-driver libaac0 libaom3 libass9 libavcodec58 libavformat58 libavutil56 libbdplus0 libblas3 libbluray2 libbs2b0
libchromaprint1 libcodec2-1.0 libdav1d5 libflashrom1 libflite1 libftdi1-2 libgme0 libgsm1 libgstreamer-plugins-bad1.0-0 libigdgmm12 libilv-0-0 libllvm13 libmfx1 libmysofa1 libnorm1 libopenmpt0
libpgm-5.3-0 libpostproc55 librabbitmq4 librubberband2 libserd-0-0 libshine3 libsnappy1v5 libsord-0-0 libsratom-0-0 libstr1.4-gnutls libssh-gcrypt-4 libswresample3 libswscale5 libudfread0 libva-drm2
libva-wayland2 libva-x11-2 libva2 libvdpau1 libvidstab1.1 libx265-199 libxvidcore4 libzimg2 libzmq5 libzvb-common libzvb0 mesa-va-drivers mesa-vdpau-drivers pocketsphinx-en-us va-driver-all
vdpau-driver-all
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
cpu-checker ibverbs-providers ipxe-qemu ipxe-qemu-256k-compat-efi-roms libaio1 libcacard0 libdaxctl1 libdecor-0 libdecor-0-plugin-1-cairo libfdt1 libgfpapi0 libgfrpc0 libgfxdr0 libglusterfs0
libibverbs1 libiscsi7 libndctl6 libpmem1 libpmemobj1 libqrencode4 librados2 librbd1 librdmacm1 libsd2-2.0-0 libspice-server1 liburing2 libusbredirparser1 libvirglrenderer1 msr-tools ovmf pass
qemu-block-extra qemu-system-common qemu-system-data qemu-system-gui qemu-system-x86 qemu-utils qrencode seabios tree uidmap xclip
Suggested packages:
gstreamer1.0-libav libxml-simple-perl python ruby samba vde2 debootstrap
The following NEW packages will be installed:
cpu-checker docker-desktop ibverbs-providers ipxe-qemu ipxe-qemu-256k-compat-efi-roms libaio1 libcacard0 libdaxctl1 libdecor-0 libdecor-0-plugin-1-cairo libfdt1 libgfpapi0 libgfrpc0 libgfxdr0
libglusterfs0 libibverbs1 libiscsi7 libndctl6 libpmem1 libpmemobj1 libqrencode4 librados2 librbd1 librdmacm1 libsd2-2.0-0 libspice-server1 liburing2 libusbredirparser1 libvirglrenderer1 msr-tools
ovmf pass qemu-block-extra qemu-system-common qemu-system-data qemu-system-gui qemu-system-x86 qemu-utils qrencode seabios tree uidmap xclip
0 upgraded, 43 newly installed, 0 to remove and 11 not upgraded.
Need to get 35.1 MB/426 MB of archives.
After this operation, 125 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 libaio1 amd64 0.3.112-13build1 [7,176 B]
Get:2 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 libfdt1 amd64 1.6.1-1 [20.0 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 libibverbs1 amd64 39.0-1 [69.3 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 libdaxctl1 amd64 72.1-1 [19.8 kB]
Get:5 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 libndctl6 amd64 72.1-1 [57.7 kB]
Get:6 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 libpmem1 amd64 1.11.1-3build1 [81.4 kB]
Get:7 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 librdmacm1 amd64 39.0-1 [71.2 kB]
Get:8 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 liburing2 amd64 2.1-2build1 [10.3 kB]
Get:9 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 libcacard0 amd64 1:2.8.0-3build2 [38.0 kB]
Get:10 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 libspice-server1 amd64 0.15.0-2ubuntu4 [351 kB]
Get:11 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 libusbredirparser1 amd64 0.11.0-2build1 [15.9 kB]
Get:12 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 qemu-system-common amd64 1:6.2+dfsg-2ubuntu6.16 [2,048 kB]
Get:13 /home/swapnil/GL/docker-desktop-4.27.1-amd64.deb docker-desktop amd64 4.27.1-136059 [391 MB]
Get:14 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 qemu-system-data all 1:6.2+dfsg-2ubuntu6.16 [1,431 kB]
Get:15 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 seabios all 1.15.0-1 [174 kB]
Get:16 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 ipxe-qemu all 1.21.1+git-20220113.fbbdc3926-0ubuntu1 [1,569 kB]
Get:17 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 ipxe-qemu-256k-compat-efi-roms all 1.0.0+git-20150424.a25a16d-0ubuntu4 [552 kB]
Get:18 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 qemu-system-x86 amd64 1:6.2+dfsg-2ubuntu6.16 [10.1 MB]
Get:19 http://in.archive.ubuntu.com/ubuntu jammy/universe amd64 tree amd64 2.0.2-1 [47.9 kB]
Get:20 http://in.archive.ubuntu.com/ubuntu jammy/universe amd64 pass all 1.7.4-5 [35.2 kB]
Get:21 http://in.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 uidmap amd64 1:4.8.1-2ubuntu2.1 [22.4 kB]
Get:22 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 msr-tools amd64 1.3-4 [10.3 kB]
Get:23 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 cpu-checker amd64 0.7-1.3build1 [6,800 B]
Get:24 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 ibverbs-providers amd64 39.0-1 [341 kB]
Get:25 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 libdecor-0 amd64 0.1.0-3build1 [15.1 kB]
Get:26 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 libdecor-0-plugin-1-cairo amd64 0.1.0-3build1 [20.4 kB]
Get:27 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libgfxdr0 amd64 10.1-1ubuntu0.2 [22.3 kB]
Get:28 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libglusterfs0 amd64 10.1-1ubuntu0.2 [287 kB]
Get:29 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libgfrpc0 amd64 10.1-1ubuntu0.2 [47.1 kB]
Get:30 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libgfa
```



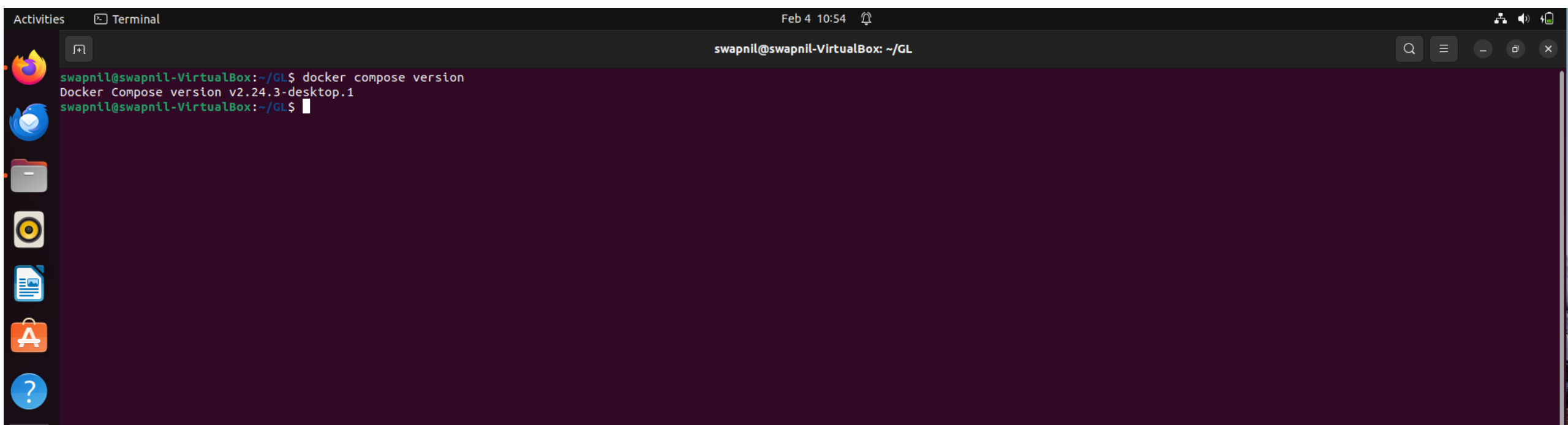
# Installing Docker : Curl update



A terminal window titled "swapnil@swapnil-VirtualBox: ~/GL" showing the command to install curl. The output shows that ca-certificates is already installed and curl is being installed. The terminal text is as follows:

```
swapnil@swapnil-VirtualBox:~/GL$ sudo apt-get install ca-certificates curl
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
ca-certificates is already the newest version (20230311ubuntu0.22.04.1).
ca-certificates set to manually installed.
The following packages were automatically installed and are no longer required:
 chromium-codecs-ffmpeg-extra gstreamer1.0-vaapi i965-va-driver intel-media-va-driver libaacs0 libaom3 libass9 libavcodec58 libavformat58 libavutil56 libbdplus0 libblas3 libbluray2 libbs2b0
 libchromaprint1 libcodec2-1.0 libdavid5 libflashrom1 libflite1 libftdi1-2 libgme0 libgsm1 libgstreamer-plugins-bad1.0-0 libigdgmm12 liblilv-0-0 libllvm13 libmfx1 libmysofa1 libnorm1 libopenmpt0
 libpgm-5.3-0 libpostproc55 librabbitmq4 librubberband2 libserd-0-0 libshine3 libsnappy1v5 libsord-0-0 libsratom-0-0 libsrtp1.4-gnutls libssh-gcrypt-4 libswresample3 libswscale5 libudfread0 libva-drm2
 libva-wayland2 libva-x11-2 libva2 libvdpau1 libvidstab1.1 libx265-199 libxvidcore4 libzimg2 libzmq5 libzvbi-common libzvbi0 mesa-va-drivers mesa-vdpau-drivers pocketsphinx-en-us va-driver-all
 vdpau-driver-all
Use 'sudo apt autoremove' to remove them.
The following NEW packages will be installed:
 curl
0 upgraded, 1 newly installed, 0 to remove and 15 not upgraded.
Need to get 194 kB of archives.
After this operation, 454 kB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 curl amd64 7.81.0-1ubuntu1.15 [194 kB]
Fetched 194 kB in 3s (73.1 kB/s)
Selecting previously unselected package curl.
(Reading database ... 204982 files and directories currently installed.)
Preparing to unpack .../curl_7.81.0-1ubuntu1.15_amd64.deb ...
Unpacking curl (7.81.0-1ubuntu1.15) ...
Setting up curl (7.81.0-1ubuntu1.15) ...
Processing triggers for man-db (2.10.2-1) ...
swapnil@swapnil-VirtualBox:~/GL$
```

# Installing Docker : Checking Version



A screenshot of a Linux desktop environment with a terminal window open. The terminal title bar reads "swapnil@swapnil-VirtualBox: ~/GL". The terminal shows the command "docker compose version" being executed, which returns "Docker Compose version v2.24.3-desktop.1". The desktop background is dark purple, and the left sidebar contains icons for Firefox, Telegram, Files, OBS Studio, LibreOffice Writer, and the App Store. The top of the window shows the "Activities" menu, "Terminal" tab, the date and time "Feb 4 10:54", and system status icons.

```
swapnil@swapnil-VirtualBox: ~/GL$ docker compose version
Docker Compose version v2.24.3-desktop.1
swapnil@swapnil-VirtualBox: ~/GL$
```



# Creating Docker file and building image

Ubuntu [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Activities Visual Studio Code Feb 12 01:03

Dockerfile - Microservices - Visual Studio Code

File Edit Selection View Go Run Terminal Help

EXTENSIONS: MARKETPLACE @exe:"docker"

- Docker** 437ms  
Makes it easy to create, manage, a...  
Microsoft
- Dev Containers** 443ms  
Open any folder or repository insi...  
Microsoft
- Kubernetes** 3.8M ★ 4.5  
Develop, deploy and debug Kuber...  
Microsoft [Install](#)
- Google Cloud Code** 1M ★ 3  
Duet AI + Tools For Google Cloud  
Google Cloud [Install](#)

```
1 # For more information, please refer to https://aka.ms/vscode-docker-python
2 FROM python:3.10-slim
3
4 EXPOSE 5000
5
6 # Keeps Python from generating .pyc files in the container
7 ENV PYTHONDONTWRITEBYTECODE=1
8
9 # Turns off buffering for easier container logging
10 ENV PYTHONUNBUFFERED=1
11
12 # Install pip requirements
13 COPY requirements.txt .
14 RUN python -m pip install -r requirements.txt
15
16 WORKDIR /app
17 COPY . /app
18
19 # Creates a non-root user with an explicit UID and adds permission to access the /app folder
20 # For more info, please refer to https://aka.ms/vscode-docker-python-configure-containers
21 RUN adduser -u 5678 --disabled-password --gecos "" appuser && chown -R appuser /app
22 USER appuser
23
24 # During debugging, this entry point will be overridden. For more information, please refer to https://aka.ms/vscode-docker-python-debug
25 CMD ["gunicorn", "--bind", "0.0.0.0:5000", "app:app"]
26
```

PROBLEMS OUTPUT DEBUG CONSOLE **TERMINAL** PORTS

```
bash
---> 296d4c361287
Step 10/11 : USER appuser
---> Using cache
---> dea96d82cfb5
Step 11/11 : CMD ["gunicorn", "--bind", "0.0.0.0:5000", "app:app"]
---> Using cache
---> 3ec8d28116d0
Successfully built 3ec8d28116d0
Successfully tagged w11_assignment:latest
(venv) swapnil@swapnil-VirtualBox:~/GL/Microservices$
```

Ln 22, Col 13 (7 selected) Spaces: 4 UTF-8 CRLF Dockerfile

# Checking images

Ubuntu [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Activities Visual Studio Code

Feb 12 01:07

Dockerfile - Microservices - Visual Studio Code

File Edit Selection View Go Run Terminal Help

EXTENSIONS: MARKETPLACE

@exe:"docker"

**Docker**  
Makes it easy to create, manage, a...  
Microsoft

**Dev Containers**  
Open any folder or repository insi...  
Microsoft

**Kubernetes**  
Develop, deploy and debug Kuber...  
Microsoft

**Google Cloud Code**  
Duet AI + Tools for Google Cloud  
Google Cloud

app.py M

example\_calls.txt

Dockerfile u X

Dockerfile > ...

```
1 # For more information, please refer to https://aka.ms/vscode-docker-python
2 FROM python:3.10-slim
3
4 EXPOSE 5000
5
6 # Keeps Python from generating .pyc files in the container
7 ENV PYTHONDONTWRITEBYTECODE=1
8
9 # Turns off buffering for easier container logging
10 ENV PYTHONUNBUFFERED=1
11
12 # Install pip requirements
13 COPY requirements.txt .
14 RUN python -m pip install -r requirements.txt
15
16 WORKDIR /app
17 COPY . /app
18
19 # Creates a non-root user with an explicit UID and adds permission to access the /app folder
20 # For more info, please refer to https://aka.ms/vscode-docker-python-configure-containers
21 RUN adduser -u 5678 --disabled-password --gecos "" appuser && chown -R appuser /app
22 USER appuser
23
24 # During debugging, this entry point will be overridden. For more information, please refer to https://aka.ms/vscode-docker-python-debug
25 CMD ["unicorn", "--bind", "0.0.0.0:5000", "app:app"]
26
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
(venv) swapnil@swapnil-VirtualBox:~/GL/Microservices$ sudo docker images -a
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
<none>              <none>             dea96d82cfb5       3 days ago        1.46GB
w11 assignment       latest             3ec8d28116d0       3 days ago        1.46GB
swapnilpatil/swapnilpatil latest           3ec8d28116d0       3 days ago        1.46GB
<none>              <none>             296d4c361287       3 days ago        1.46GB
<none>              <none>             4ac8a1ea832b       3 days ago        1.07GB
<none>              <none>             42b6713e013c       3 days ago        677MB
<none>              <none>             161ab96f3f35       3 days ago        677MB
<none>              <none>             c73adc269a05       3 days ago        128MB
```

# Running container on port 5000

Ubuntu [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Activities Visual Studio Code Feb 12 01:12

Dockerfile - Microservices - Visual Studio Code

File Edit Selection View Go Run Terminal Help

EXTENSIONS: MARKETPLACE

@exe:"docker"

Docker Makes it easy to create, manage, a... 437ms  
Microsoft

Dev Containers Open any folder or repository insi... 443ms  
Microsoft

Kubernetes Develop, deploy and debug Kuber... 3.8M 4.5  
Microsoft

Google Cloud Code Duet AI + Tools For Google Cloud 1M 3  
Google Cloud

Dockerfile > ...

```
1 # For more information, please refer to https://aka.ms/vscode-docker-python
2 FROM python:3.10-slim
3
4 EXPOSE 5000
5
6 # Keeps Python from generating .pyc files in the container
7 ENV PYTHONDONTWRITEBYTECODE=1
8
9 # Turns off buffering for easier container logging
10 ENV PYTHONUNBUFFERED=1
11
12 # Install pip requirements
13 COPY requirements.txt .
14 RUN python -m pip install -r requirements.txt
15
16 WORKDIR /app
17 COPY . /app
18
19 # Creates a non-root user with an explicit UID and adds permission to access the /app folder
20 # For more info, please refer to https://aka.ms/vscode-docker-python-configure-containers
21 RUN adduser -u 5678 --disabled-password --gecos "" appuser && chown -R appuser /app
22 USER appuser
23
24 # During debugging, this entry point will be overridden. For more information, please refer to https://aka.ms/vscode-docker-python-debug
25 CMD ["gunicorn", "--bind", "0.0.0.0:5000", "app:app"]
26
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

<none>	<none>	c90b94a80a04	3 days ago	128MB
python	3.10-slim	b6daa0c58bda	8 days ago	128MB
hello-world	latest	d2c94e258dcb	9 months ago	13.3kB

```
(venv) swapnil@swapnil-VirtualBox:~/GL/Microservices$ docker run -d -p 5000:5000 wll_assignment
docker: permission denied while trying to connect to the Docker daemon socket at unix:///var/run/docker.sock: Post "http://%2Fvar%2Frun%2Fdocker.sock/v1.24/containers/create": dial unix /var/run/docker.sock: connect: permission denied.
See 'docker run --help'.
(venv) swapnil@swapnil-VirtualBox:~/GL/Microservices$ sudo docker run -d -p 5000:5000 wll_assignment
1a5896b952ec6adf17bd9ff98d1b6141f2559a76b5ba32135b93e042b15c824b
(venv) swapnil@swapnil-VirtualBox:~/GL/Microservices$
```

Ln 22, Col 13 (7 selected) Spaces: 4 UTF-8 CRLF Dockerfile

# Testing App through container : Info

Ubuntu [Running] - Oracle VM VirtualBox

FileMachineViewInputDevicesHelp

ActivitiesFirefox Web BrowserFeb 12 01:17

127.0.0.1:5000/info

127.0.0.1:5000/info

JSONRaw DataHeaders

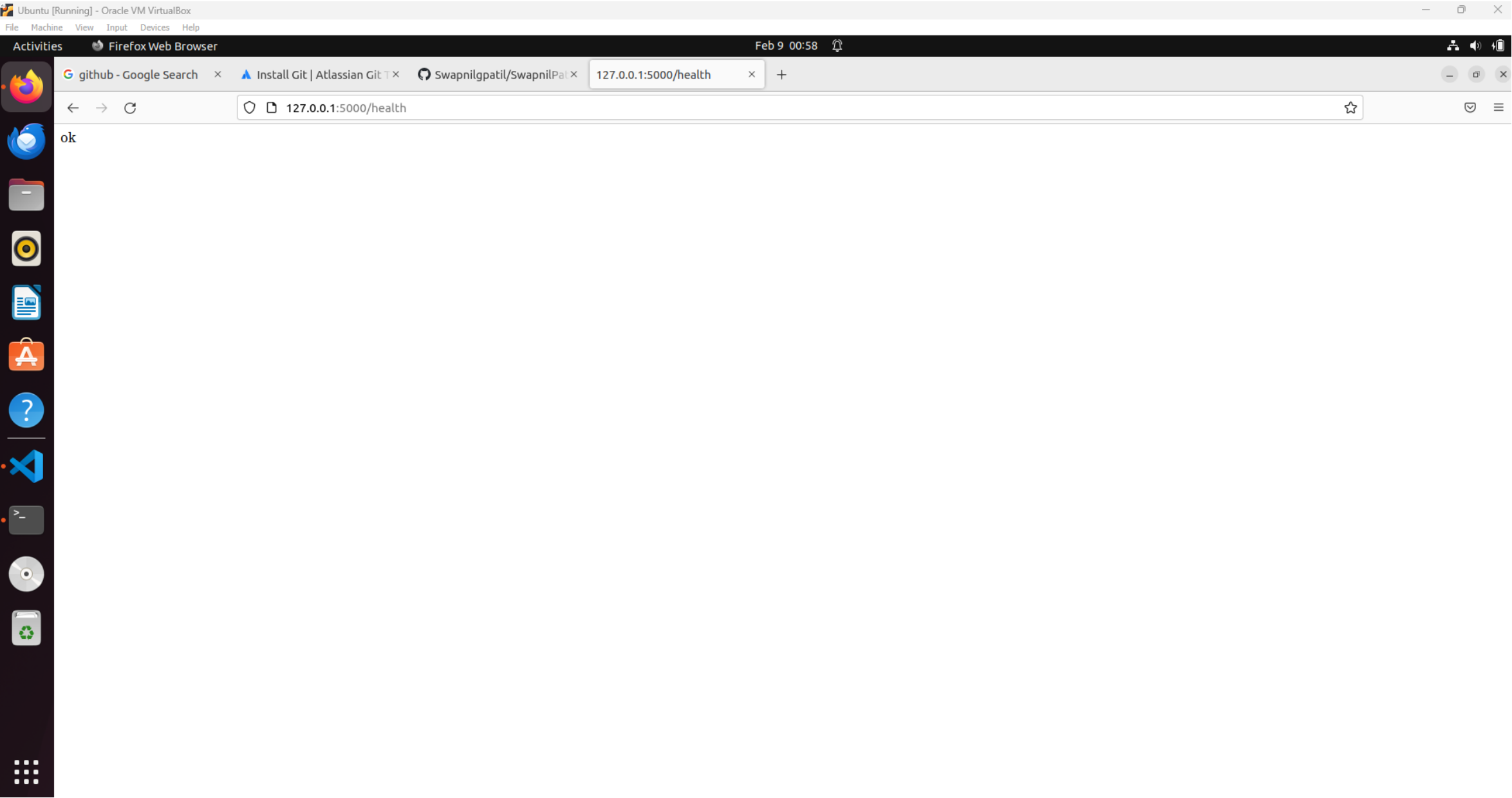
SaveCopyCollapse AllExpand AllFilter JSON

name: "Breast Cancer Wisconsin (Diagnostic)"

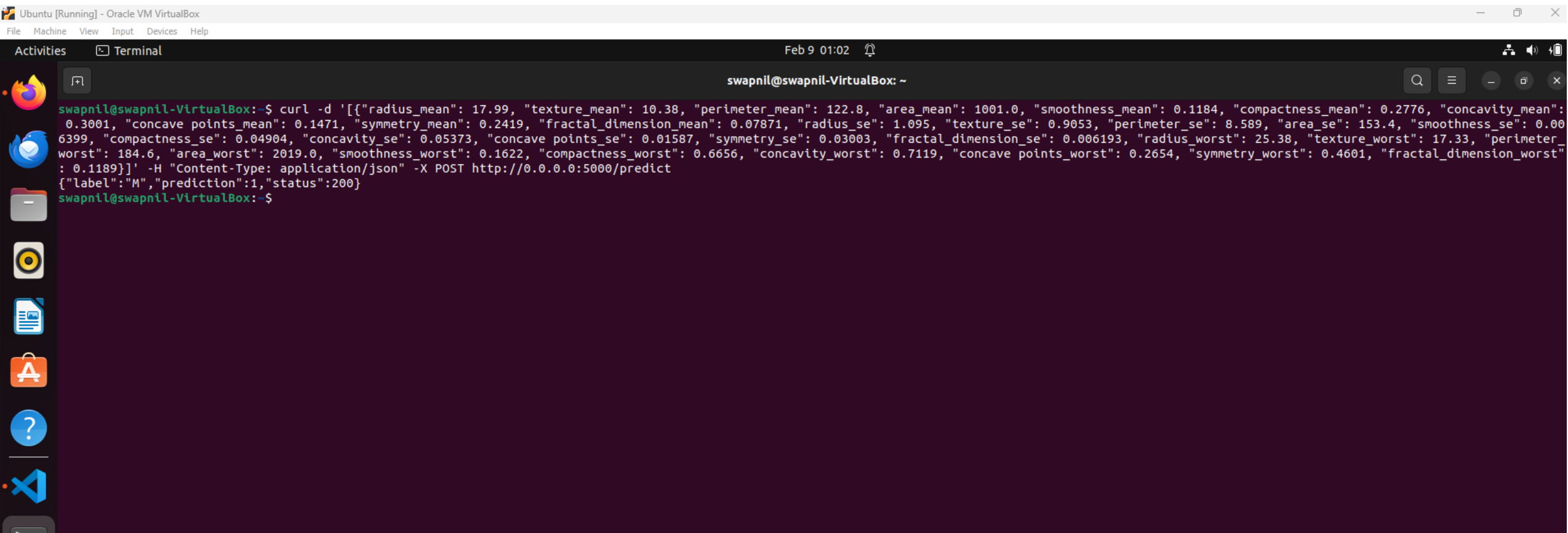
version: "v1.0.0"

Right Ctrl

# Testing App through container : Health



# Testing App through container : Inputs



The screenshot shows a terminal window titled "swapnil@swapnil-VirtualBox: ~". The terminal displays a curl command and its output. The command is a POST request to a local API endpoint with a JSON body containing various geometric features. The output shows the response from the server, including a prediction of "M" and a status of 200.

```
swapnil@swapnil-VirtualBox:~$ 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}
```