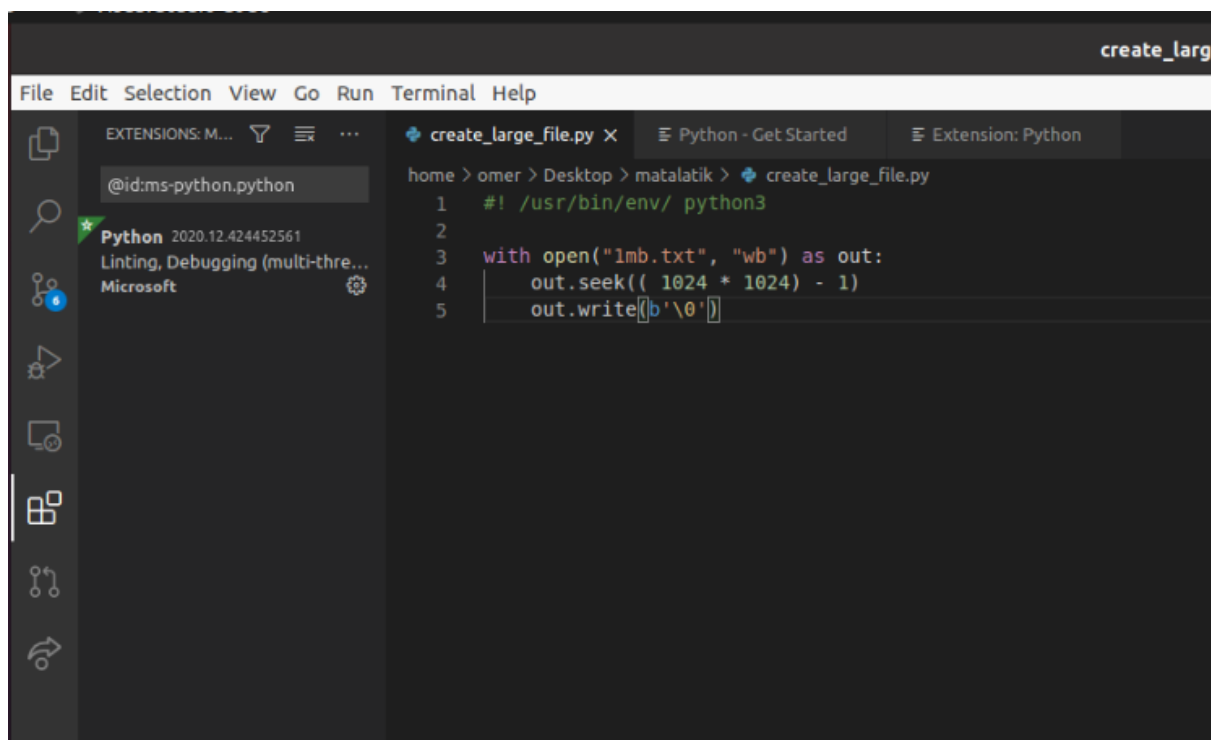


1.

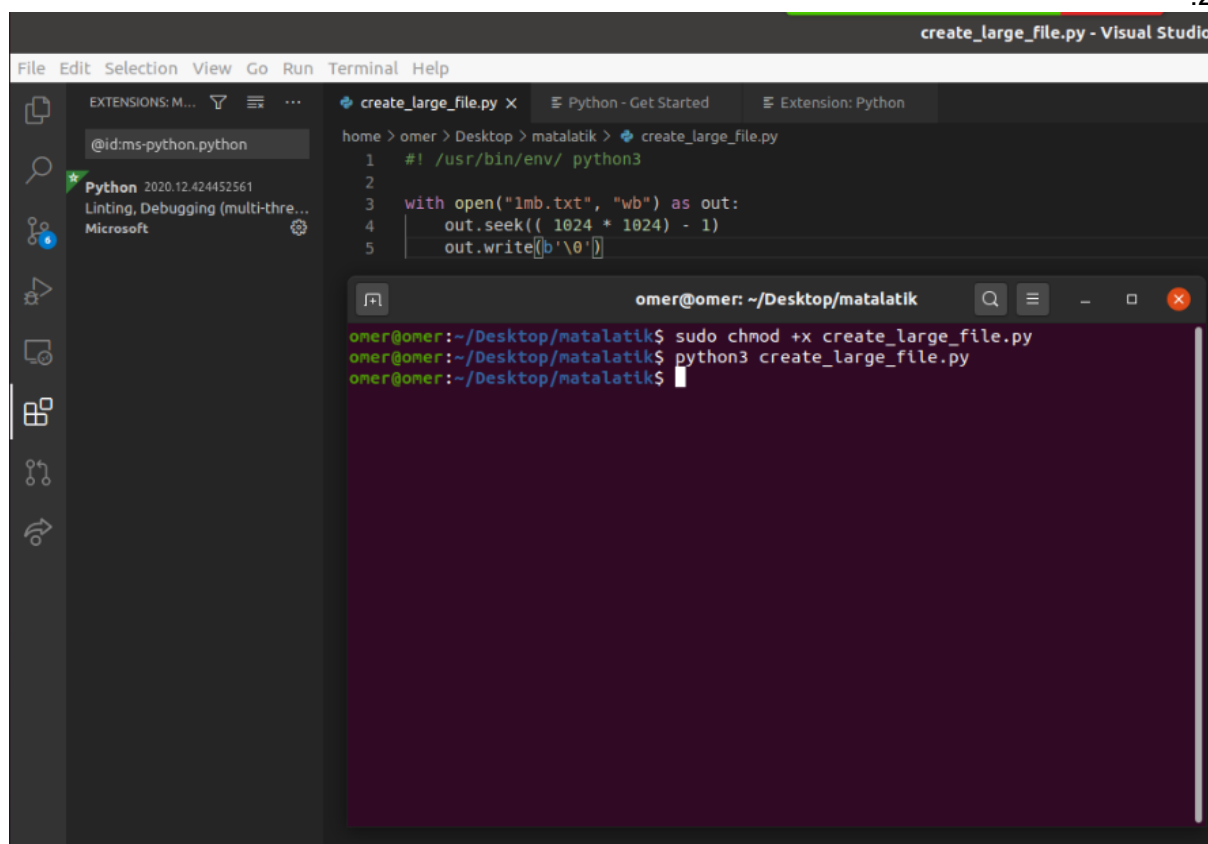


The screenshot shows the Visual Studio Code interface. The file explorer on the left shows the Python extension. The main editor window displays a file named `create_large_file.py` with the following code:

```
home > omer > Desktop > matalatik > create_large_file.py
1  #!/usr/bin/env/ python3
2
3  with open("1mb.txt", "wb") as out:
4      out.seek(( 1024 * 1024) - 1)
5      out.write(b'\0')
```

יצירת קובץ בגודל 1mg

2.

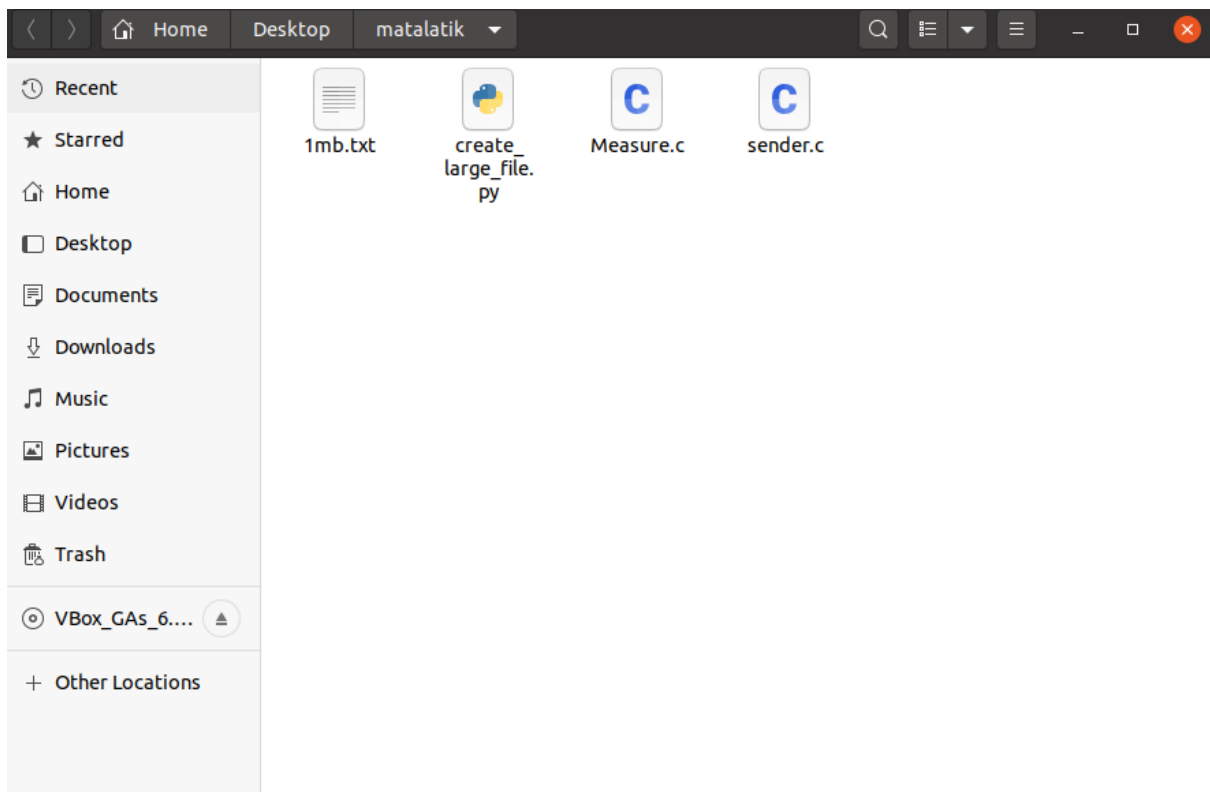


The screenshot shows the Visual Studio Code interface with the same file `create_large_file.py`. A terminal window is open at the bottom, showing the execution of the script:

```
omer@omer: ~/Desktop/matalatik
omer@omer:~/Desktop/matalatik$ sudo chmod +x create_large_file.py
omer@omer:~/Desktop/matalatik$ python3 create_large_file.py
omer@omer:~/Desktop/matalatik$
```

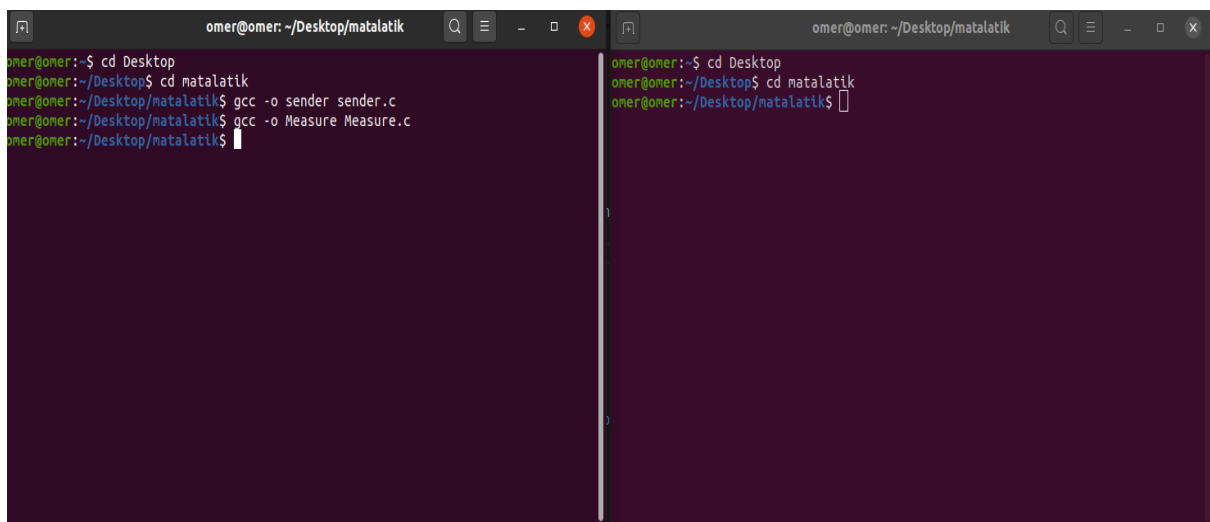
המשך יצירת הקובץ של 1mg

3.



כאן ניתן למעשה לראות את קובץ ה-1 mb בתוך התיקייה של הפרויקט.

4.



קימפול ראשוני.

.5

```
omer@omer: ~/Desktop/matalatik
omer@omer:~$ cd Desktop
omer@omer:~/Desktop$ cd matalatik
omer@omer:~/Desktop/matalatik$ gcc -o sender sender.c
omer@omer:~/Desktop/matalatik$ gcc -o Measure Measure.c
omer@omer:~/Desktop/matalatik$ ./Measure
create socket
```

יצירת סרבר.

.6

```
omer@omer:~/Desktop/matalatik$ gcc -o Measure Measure.c
omer@omer:~/Desktop/matalatik$ gcc -o sender sender.c
omer@omer:~/Desktop/matalatik$ ./Measure
create server
real time is 1 seconds
real time is 1 seconds
real time is 0 seconds
real time is 0 seconds
real time is 1 seconds
avarage time = 0.000316
general time = about 3 seconds
changed to reno algorithm
real time is 0 seconds
real time is 1 seconds
real time is 0 seconds
real time is 1 seconds
real time is 0 seconds
avarage time is= 0.000321
general time is= about 2 seconds
omer@omer:~/Desktop/matalatik$
```

```
omer@omer:~/Desktop/matalatik$ ./sender
sending file to the server 1
sending file to the server 2
sending file to the server 3
sending file to the server 4
sending file to the server 5
after changing algorithm to reno
sending file to the server 1
sending file to the server 2
sending file to the server 3
sending file to the server 4
sending file to the server 5
omer@omer:~/Desktop/matalatik$
```

. תוצאת סיום לאחר סיום הרצה ראשוני של הסרבר (שליחת פקטות).

.7

```
omer@omer:~/Desktop/matalatik$ sudo apt install iproute2
[sudo] password for omer:
Reading package lists... Done
Building dependency tree
Reading state information... Done
iproute2 is already the newest version (5.5.0-1ubuntu1).
0 upgraded, 0 newly installed, 0 to remove and 186 not upgraded.
omer@omer:~/Desktop/matalatik$
```

הורדת פאקג' בהתאם למדריך במטלה.

.8

```
omer@omer:~/Desktop/matalatik$ sudo tc qdisc change dev lo root netem loss 10%
omer@omer:~/Desktop/matalatik$ ./Measure
create server
real time is 0 seconds
real time is 0 seconds
real time is 0 seconds
real time is 0 seconds
real time is 0 seconds
avarage time = 0.000339
general time = about 0 seconds
changed to reno algorithm
real time is 0 seconds
real time is 0 seconds
real time is 0 seconds
real time is 0 seconds
real time is 0 seconds
avarage time is= 0.000508
general time is= about 0 seconds
omer@omer:~/Desktop/matalatik$
```

```
omer@omer:~/Desktop/matalatik$ ./sender
sending file to the server 1
sending file to the server 2
sending file to the server 3
sending file to the server 4
sending file to the server 5
after changing algorithm to reno
sending file to the server 1
sending file to the server 2
sending file to the server 3
sending file to the server 4
sending file to the server 5
omer@omer:~/Desktop/matalatik$
```

איבוד פקטות 10%.

```

omer@omer:~/Desktop/matalatik$ sudo tc qdisc change dev lo root netem loss 15%
omer@omer:~/Desktop/matalatik$ ./Measure
create server
real time is 12 seconds
real time is 0 seconds
real time is 2 seconds
real time is 1 seconds
real time is 2 seconds
avarage time = 0.000279
general time = about 17 seconds
changed to reno algorithm
real time is 0 seconds
real time is 0 seconds
real time is 0 seconds
real time is 0 seconds
real time is 0 seconds
avarage time is= 0.000302
general time is= about 0 seconds
omer@omer:~/Desktop/matalatik$

```

```

omer@omer:~/Desktop/matalatik$ ./sender
sending file to the server 1
sending file to the server 2
sending file to the server 3
sending file to the server 4
sending file to the server 5
after changing algorithm to reno
sending file to the server 1
sending file to the server 2
sending file to the server 3
sending file to the server 4
sending file to the server 5
omer@omer:~/Desktop/matalatik$

```

איבוד פקטות 15%.

```

omer@omer:~/Desktop/matalatik$ sudo tc qdisc change dev lo root netem loss 20%
omer@omer:~/Desktop/matalatik$ ./Measure
create server
real time is 3 seconds
real time is 33 seconds
real time is 3 seconds
real time is 1 seconds
real time is 1 seconds
avarage time = 0.000323
general time = about 41 seconds
changed to reno algorithm
real time is 1 seconds
real time is 1 seconds
real time is 1 seconds
real time is 63 seconds
real time is 0 seconds
avarage time is= 0.000367
general time is= about 66 seconds
omer@omer:~/Desktop/matalatik$ █

```

```

omer@omer:~/Desktop/matalatik$ ./sender
sending file to the server 1
sending file to the server 2
sending file to the server 3
sending file to the server 4
sending file to the server 5
after changing algorithm to reno
sending file to the server 1
sending file to the server 2
sending file to the server 3
sending file to the server 4
sending file to the server 5
omer@omer:~/Desktop/matalatik$ █

```

איבוד פקטות 20%.