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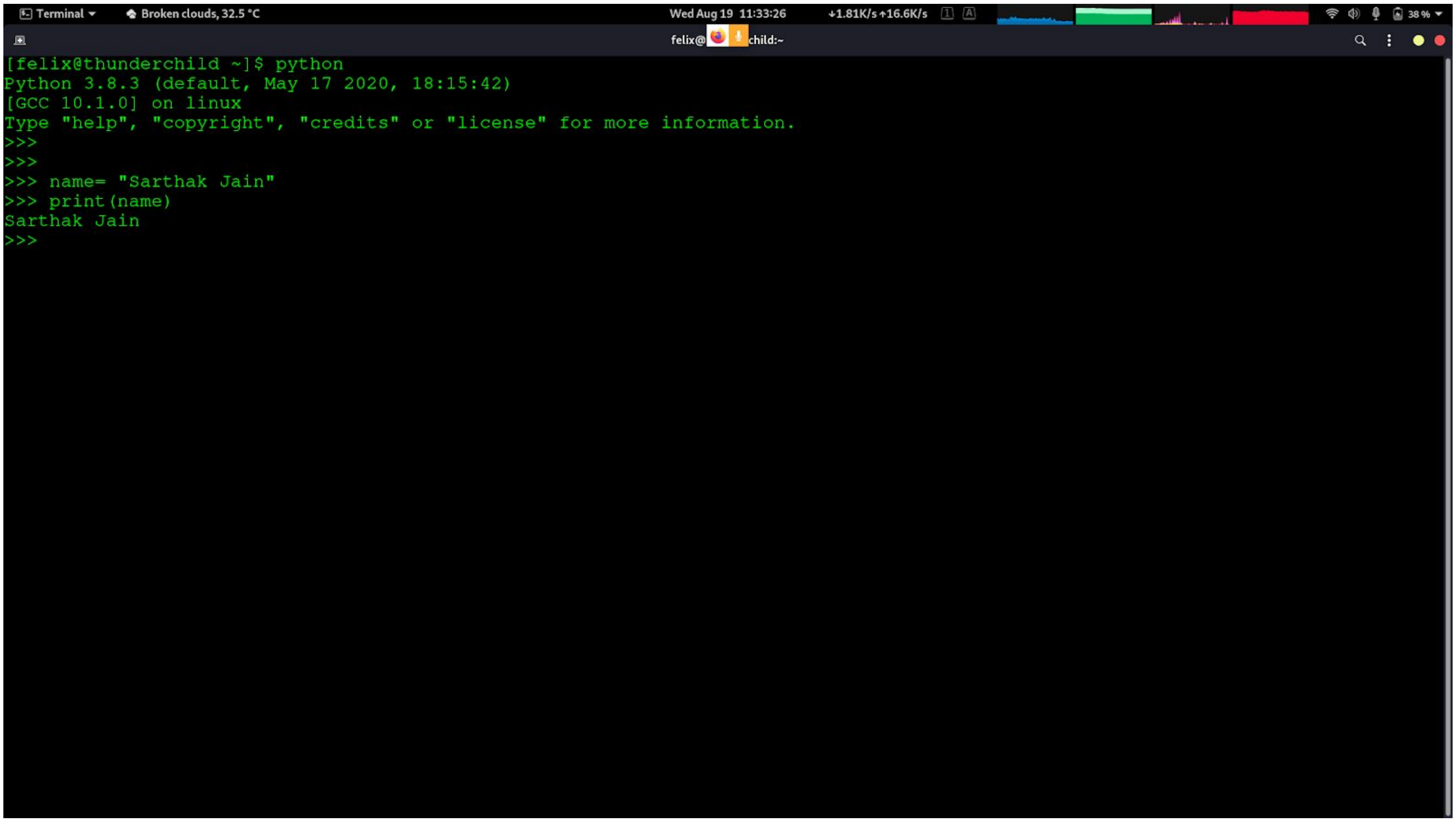
Programme: B.tech CSE AI&ML (Batch 5)
Course: Data Mining and Prediction by Machines

Lab 1 (Python Basics)

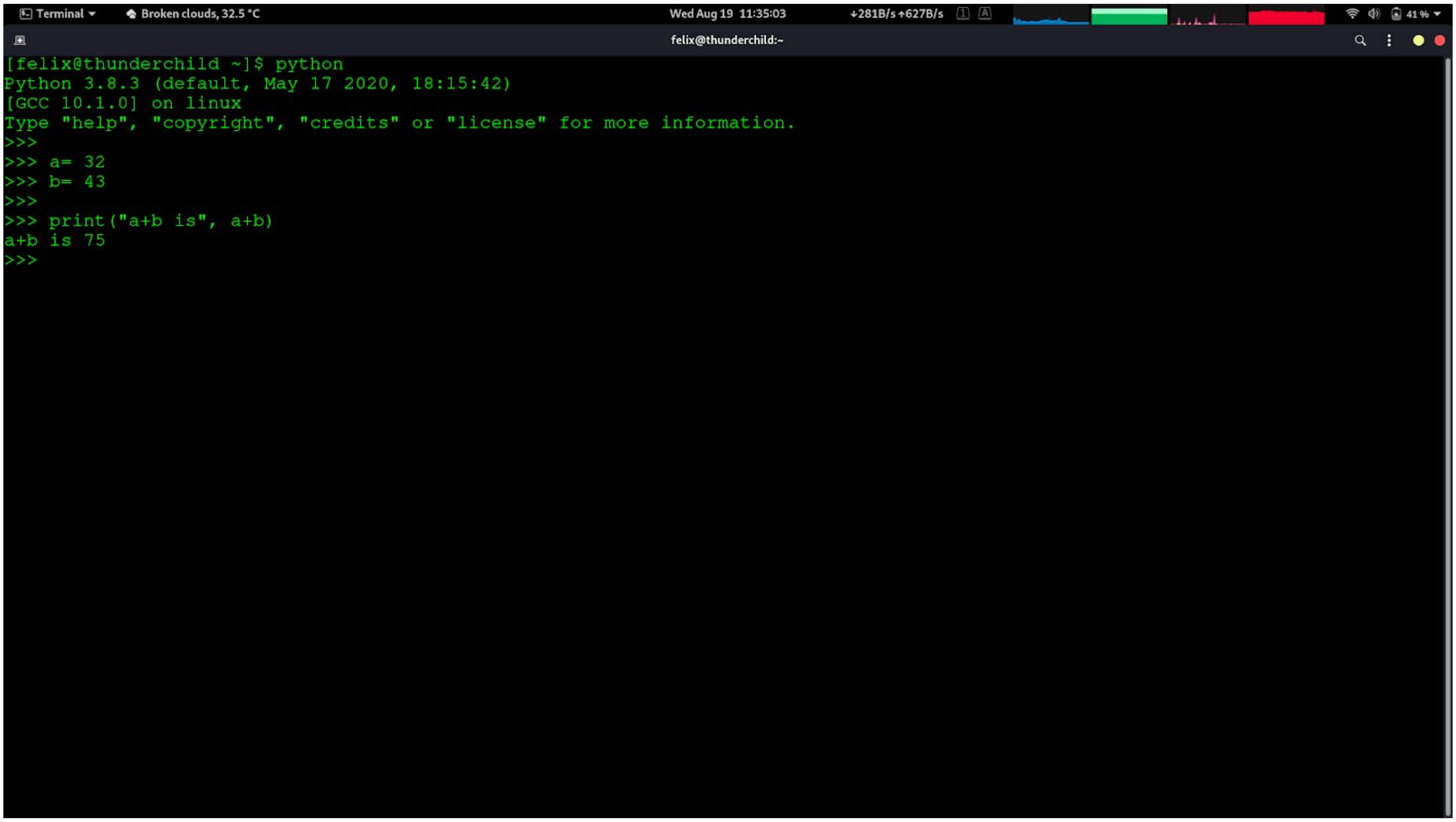
1. Python Program to Print name



```
[felix@thunderchild ~]$ python
Python 3.8.3 (default, May 17 2020, 18:15:42)
[GCC 10.1.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>>
>>>
>>> name= "Sarthak Jain"
>>> print(name)
Sarthak Jain
>>>
```

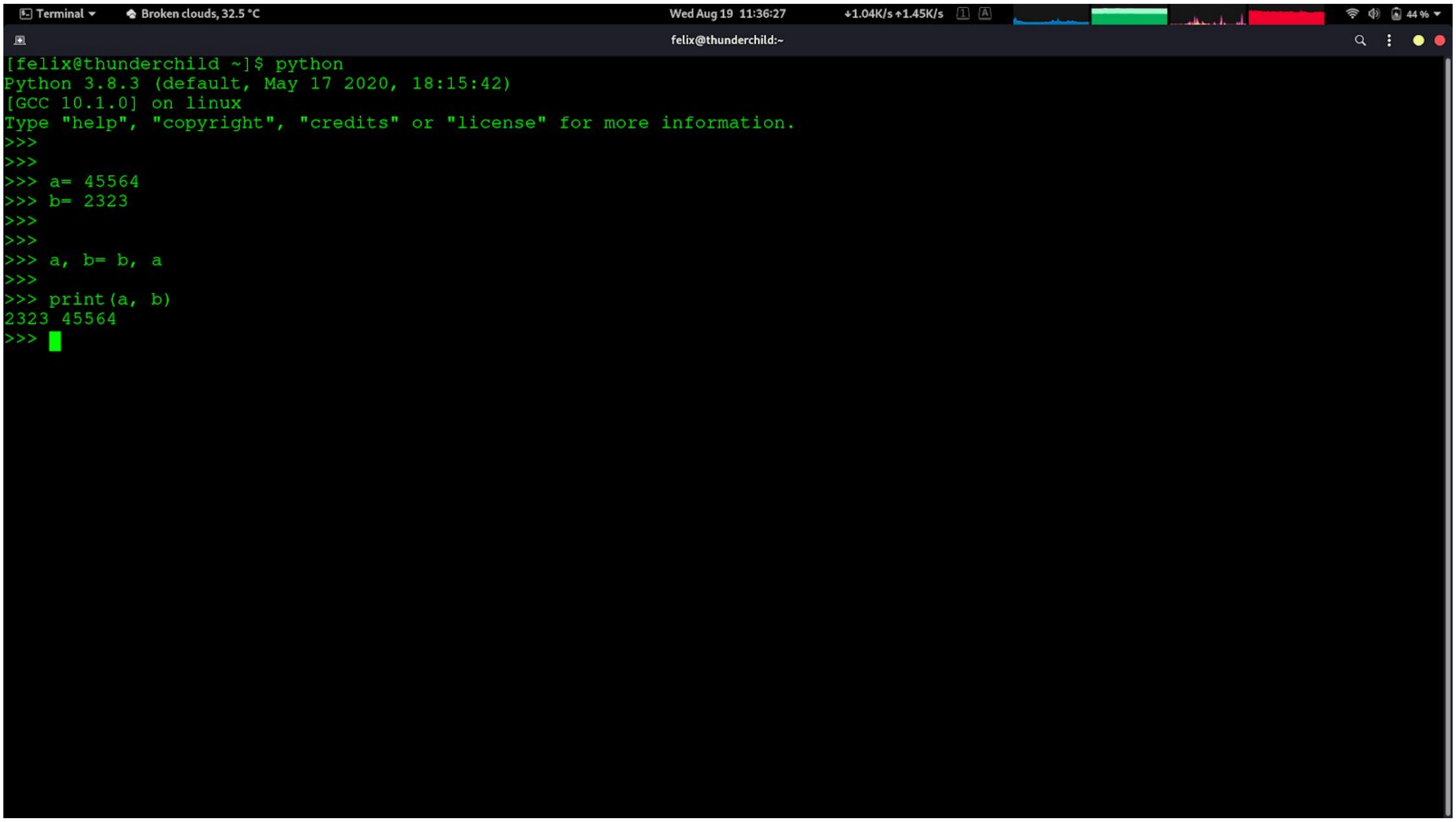
2. Python Program to Add Two Numbers

```
>>> a= 32
>>> b= 43
>>>
>>> print("a+b is", a+b)
a+b is 75
```



```
[felix@thunderchild ~]$ python
Python 3.8.3 (default, May 17 2020, 18:15:42)
[GCC 10.1.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>>
>>> a= 32
>>> b= 43
>>>
>>> print("a+b is", a+b)
a+b is 75
>>>
```

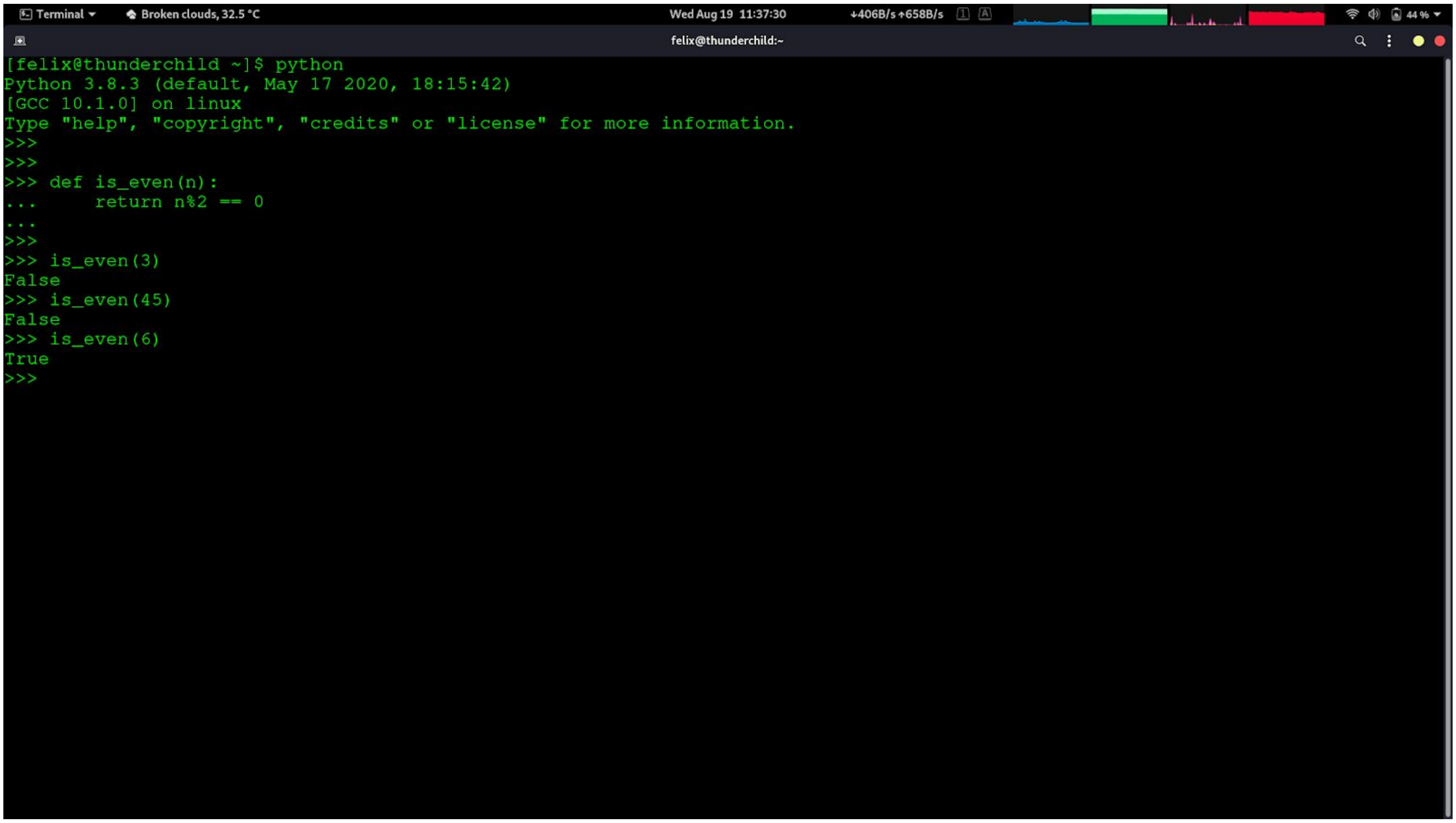
3. Python Program to Swap Two Variables



```
[felix@thunderchild ~]$ python
Python 3.8.3 (default, May 17 2020, 18:15:42)
[GCC 10.1.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>>
>>>
>>> a= 45564
>>> b= 2323
>>>
>>>
>>> a, b= b, a
>>>
>>> print(a, b)
2323 45564
>>>
```

4. Python Program to Check if a Number is Odd or Even

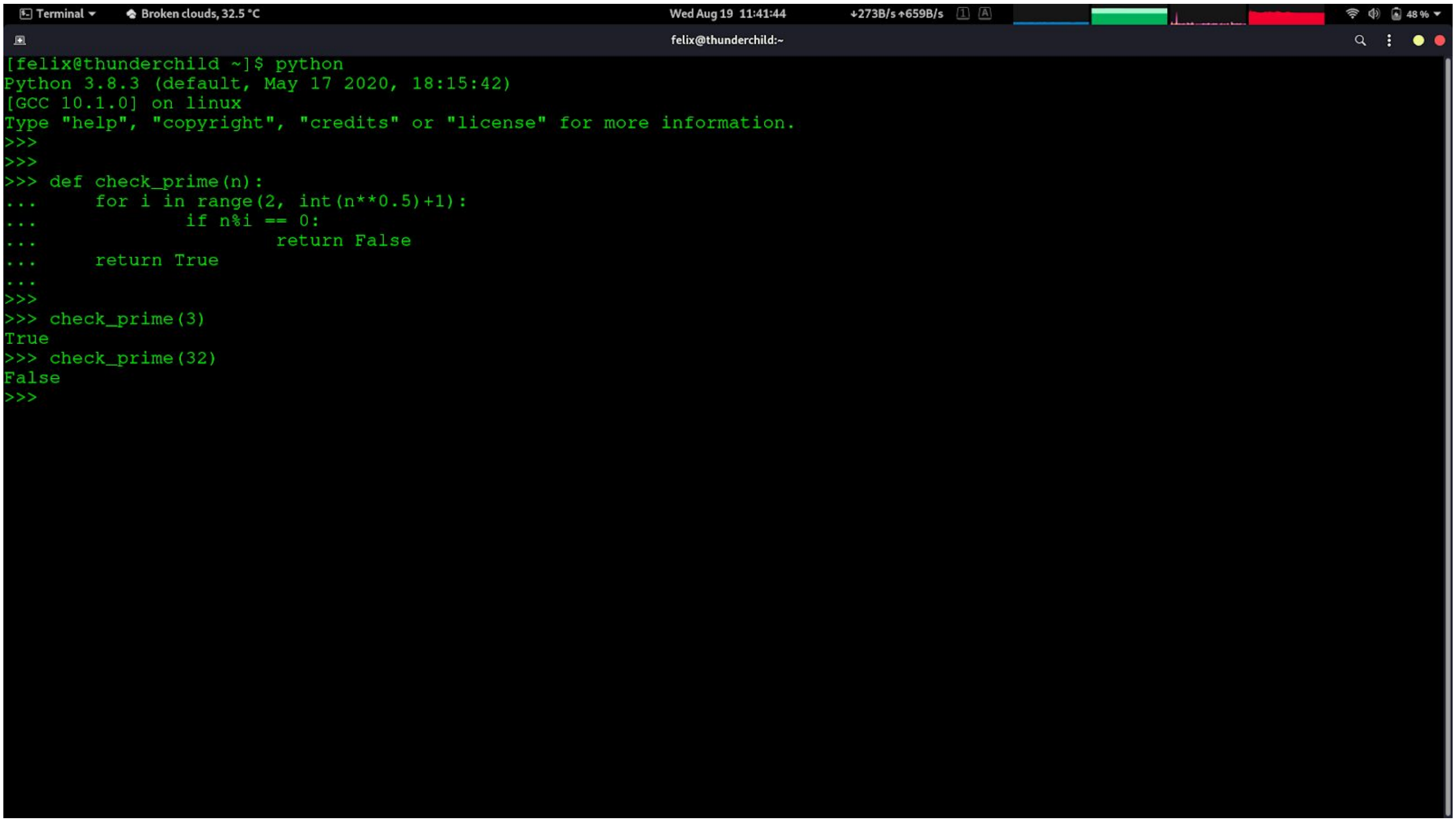
```
>>> def is_even(n):
...     return n%2 == 0
...
>>>
>>> is_even(3)
False
>>> is_even(45)
False
>>> is_even(6)
True
>>>
```



```
[felix@thunderchild ~]$ python
Python 3.8.3 (default, May 17 2020, 18:15:42)
[GCC 10.1.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>>
>>>
>>> def is_even(n):
...     return n%2 == 0
...
>>>
>>> is_even(3)
False
>>> is_even(45)
False
>>> is_even(6)
True
>>>
```

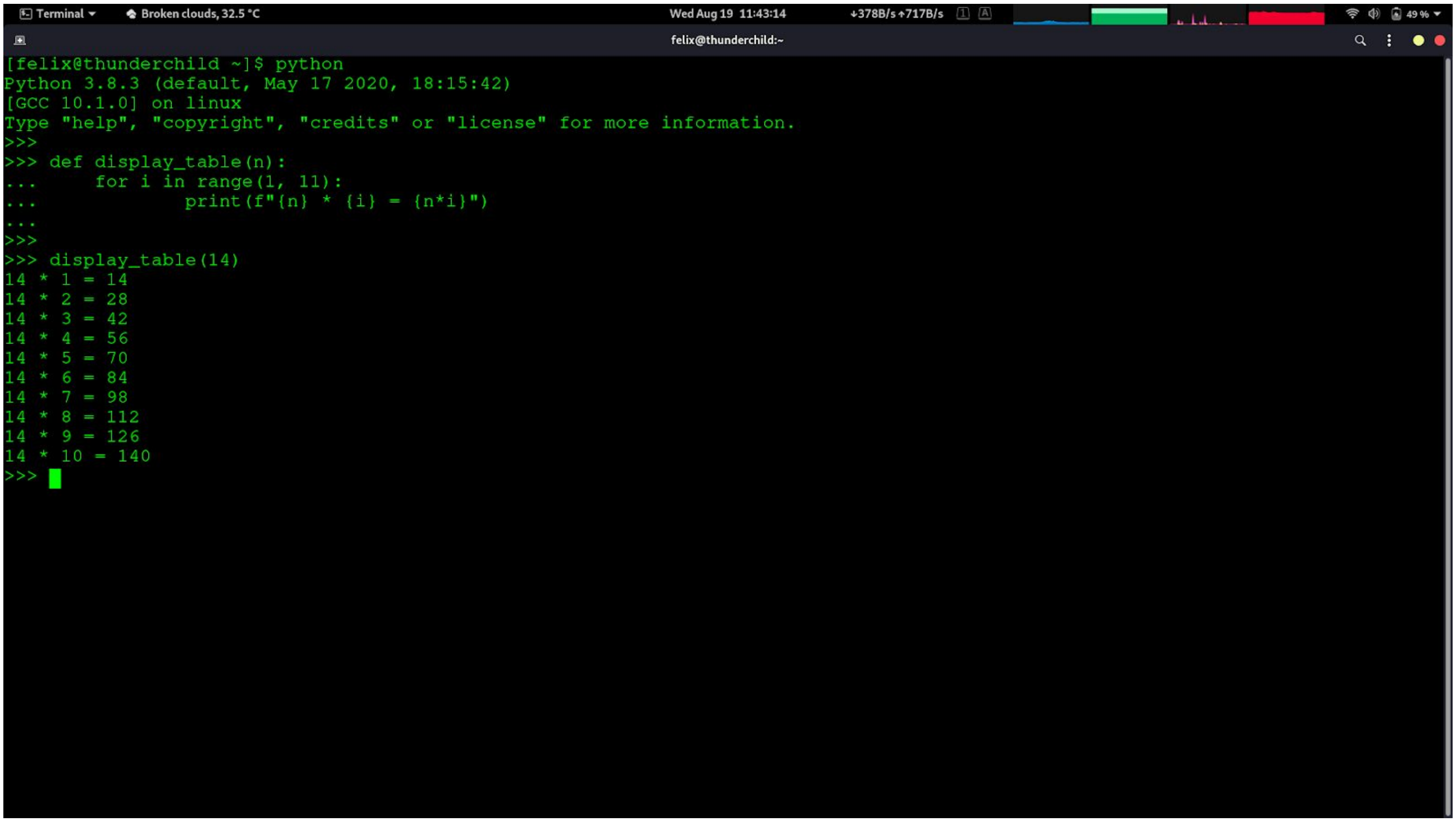
5. Python Program to Check Prime Number

```
>>> def check_prime(n):
...     for i in range(2, int(n**0.5)+1):
...             if n%i == 0:
...             return False
...     return True
...
>>>
>>> check_prime(3)
True
>>> check_prime(32)
False
```



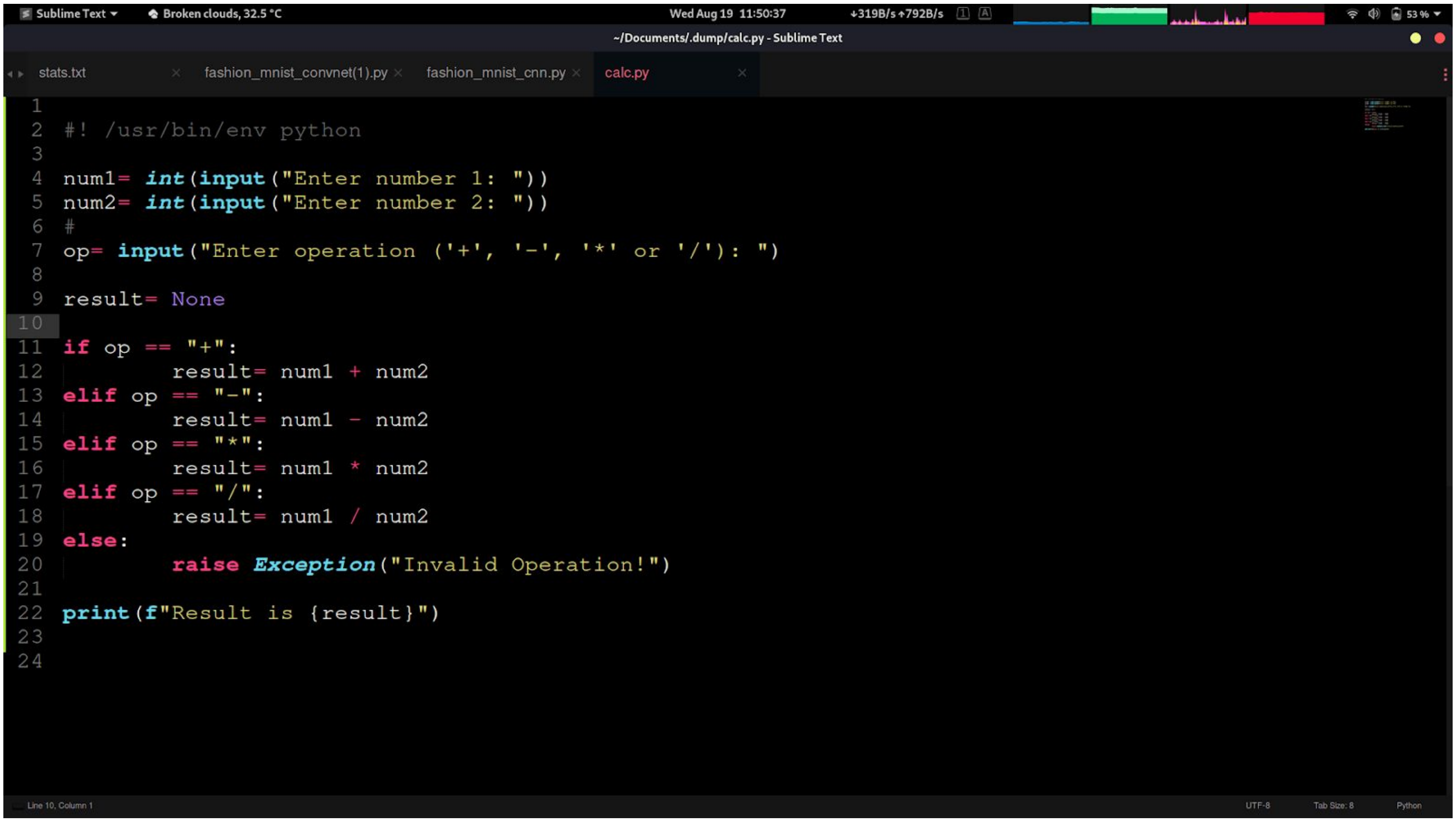
```
[felix@thunderchild ~]$ python
Python 3.8.3 (default, May 17 2020, 18:15:42)
[GCC 10.1.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>>
>>>
>>> def check_prime(n):
...     for i in range(2, int(n**0.5)+1):
...             if n%i == 0:
...                     return False
...     return True
...
>>>
>>> check_prime(3)
True
>>> check_prime(32)
False
>>>
```

6. Python Program to Display the multiplication Table

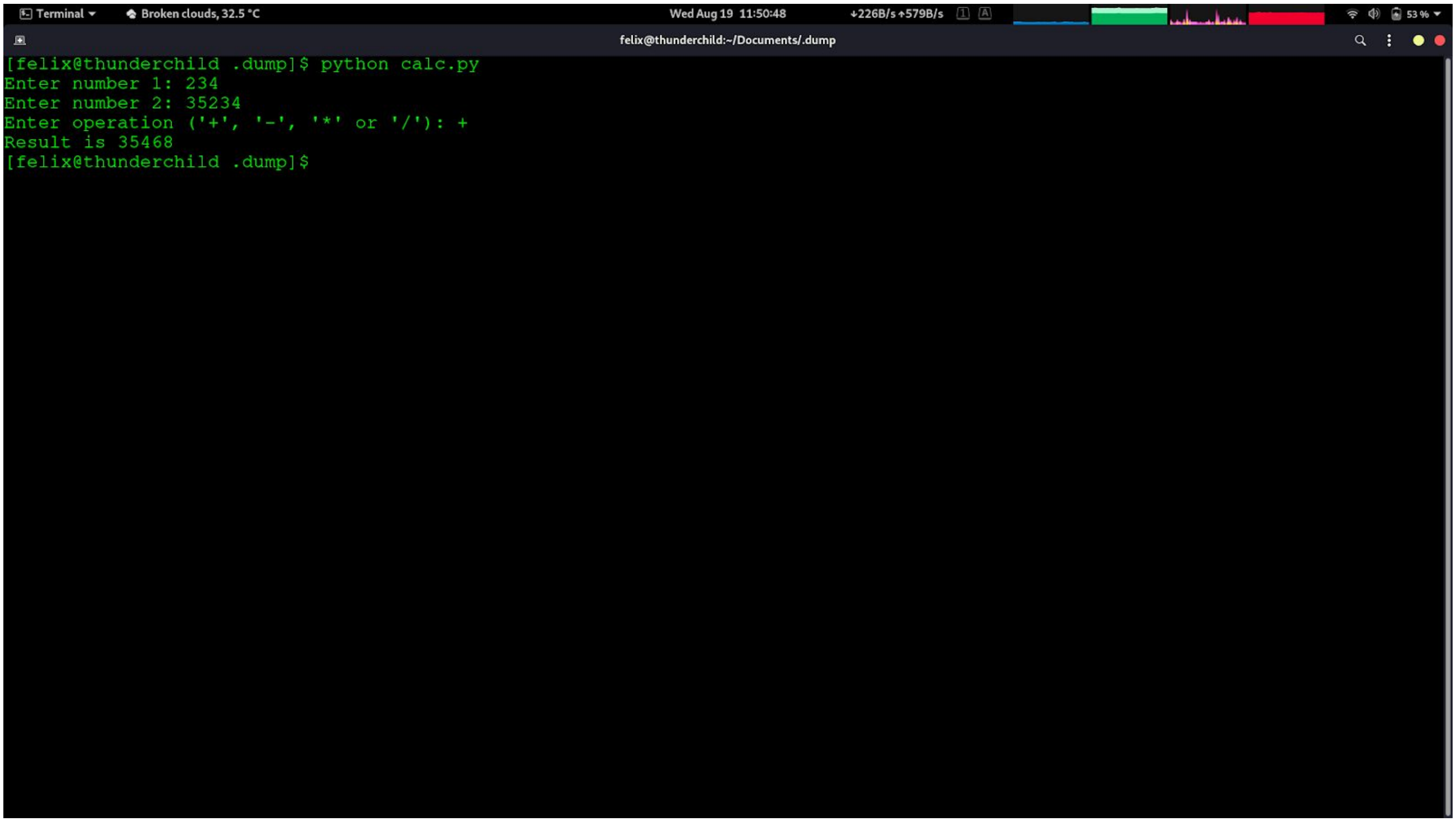


```
[felix@thunderchild ~]$ python
Python 3.8.3 (default, May 17 2020, 18:15:42)
[GCC 10.1.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>>
>>> def display_table(n):
...     for i in range(1, 11):
...             print(f"{n} * {i} = {n*i}")
...
>>>
>>> display_table(14)
14 * 1 = 14
14 * 2 = 28
14 * 3 = 42
14 * 4 = 56
14 * 5 = 70
14 * 6 = 84
14 * 7 = 98
14 * 8 = 112
14 * 9 = 126
14 * 10 = 140
>>>
```

7. Python Program to Make a Simple Calculator

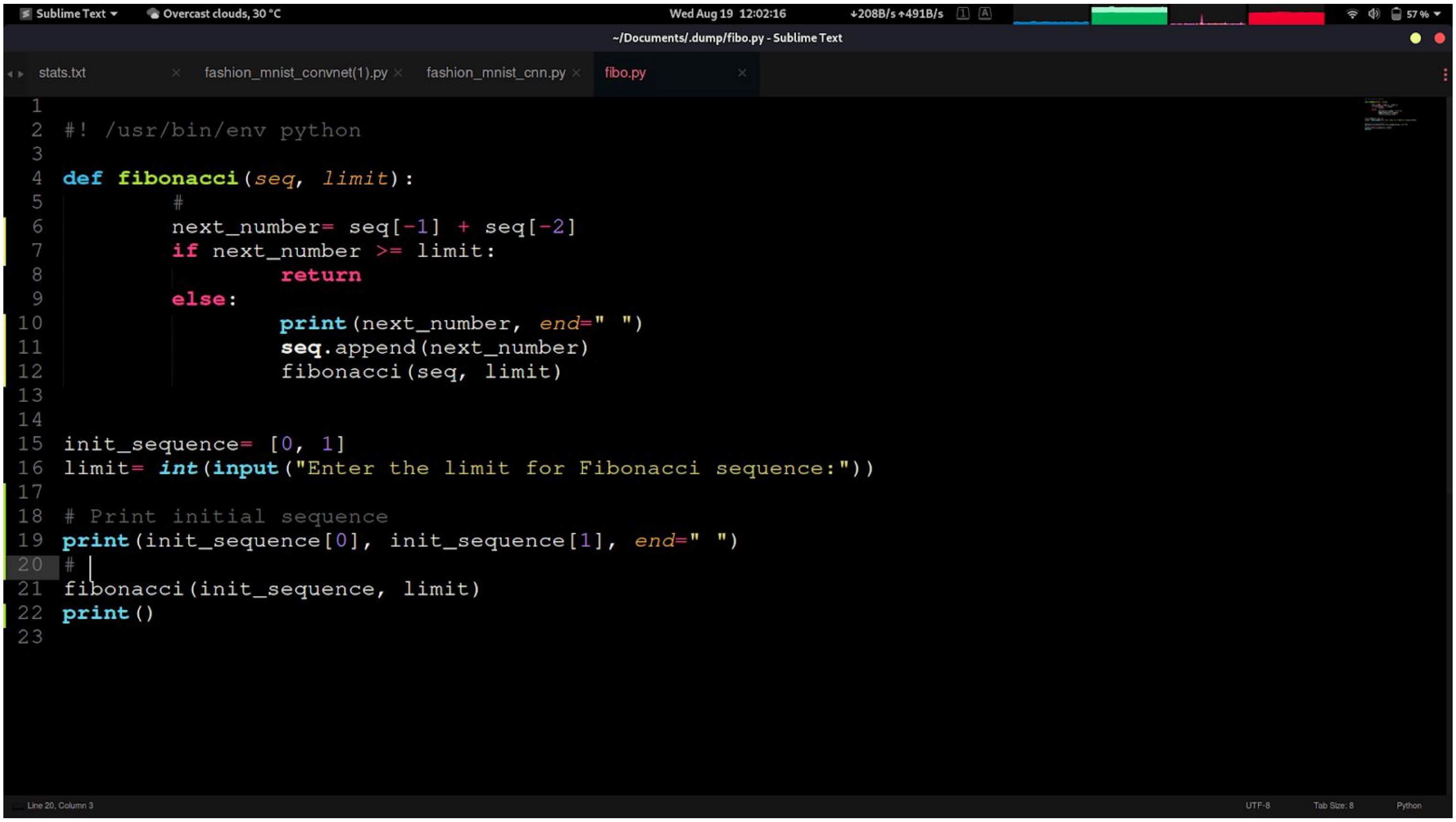


```python

#! /usr/bin/env python

num1= int(input("Enter number 1: "))
num2= int(input("Enter number 2: "))
#
op= input("Enter operation ('+', '-', '*' or '/'): ")

result= None

if op == "+":
        result= num1 + num2
elif op == "-":
        result= num1 - num2
elif op == "*":
        result= num1 * num2
elif op == "/":
        result= num1 / num2
else:
        raise Exception("Invalid Operation!")

print(f"Result is {result}")


```

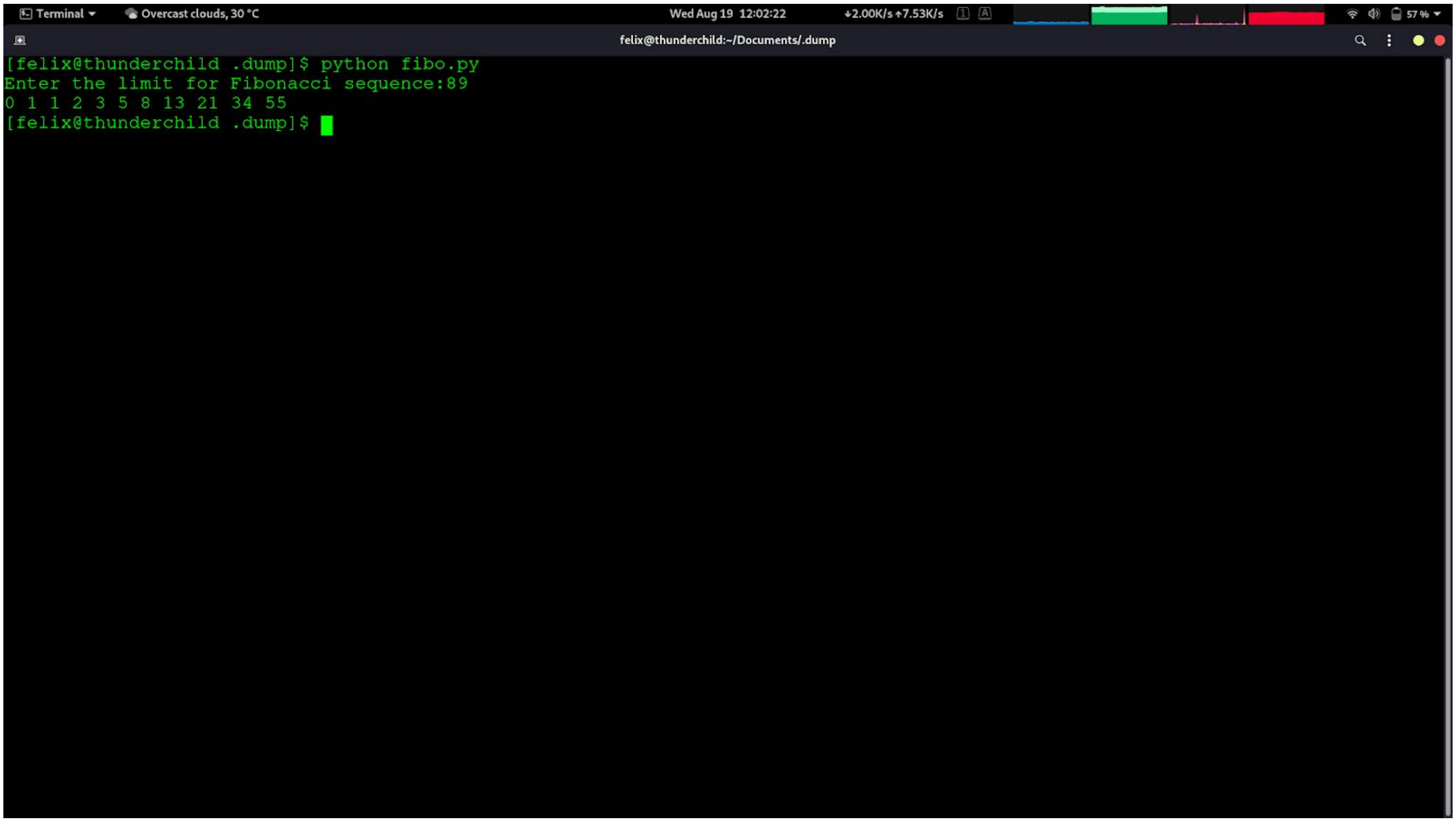


```
[felix@thunderchild .dump]$ python calc.py
Enter number 1: 234
Enter number 2: 35234
Enter operation ('+', '-', '*' or '/'): +
Result is 35468
[felix@thunderchild .dump]$
```

8. Python Program to Display Fibonacci Sequence Using Recursion

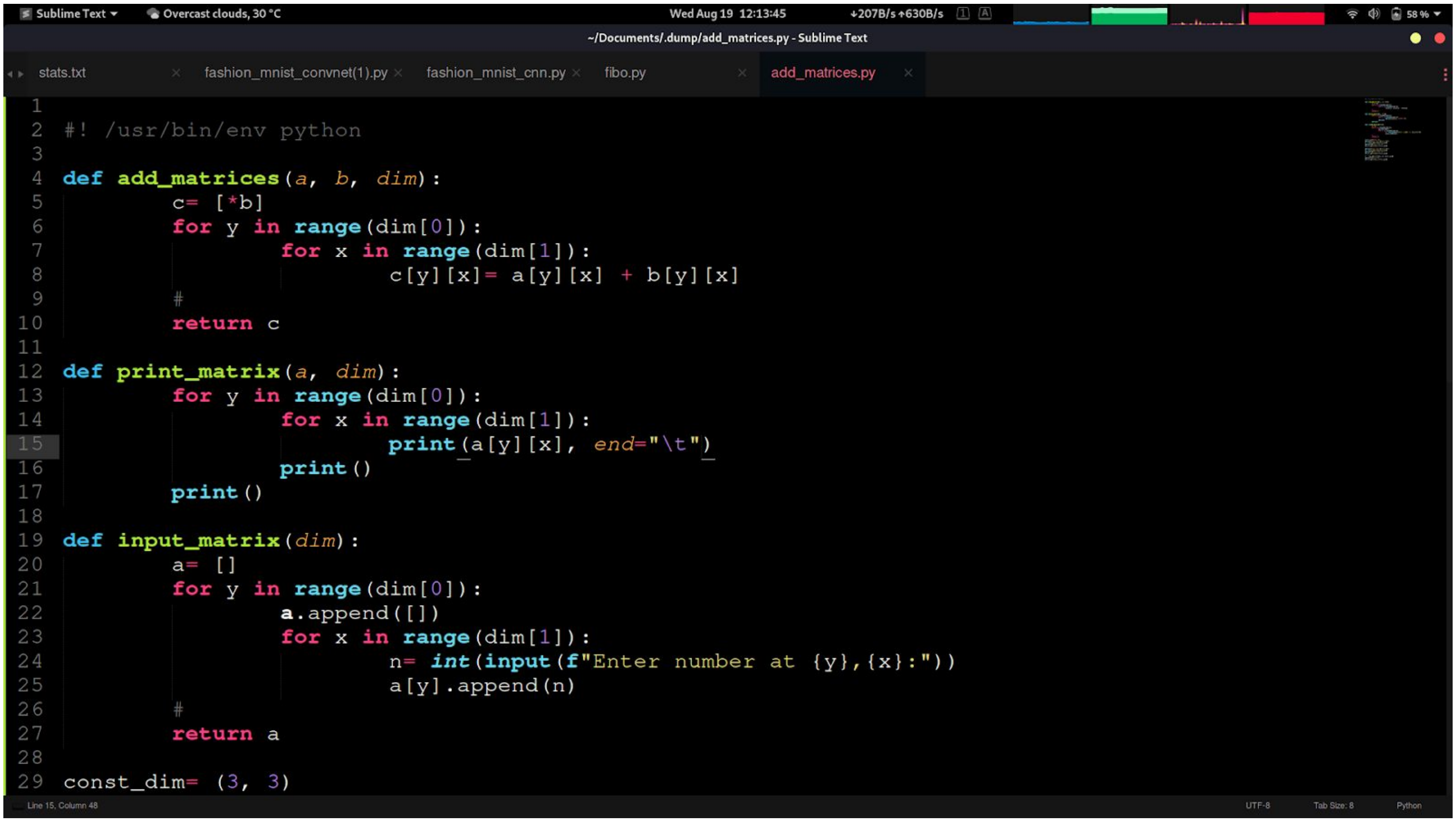


```

#! /usr/bin/env python

def fibonacci(seq, limit):
        #
        next_number= seq[-1] + seq[-2]
        if next_number >= limit:
                return
        else:
                print(next_number, end=" ")
                seq.append(next_number)
                fibonacci(seq, limit)


init_sequence= [0, 1]
limit= int(input("Enter the limit for Fibonacci sequence:"))

# Print initial sequence
print(init_sequence[0], init_sequence[1], end=" ")
# 
fibonacci(init_sequence, limit)
print()

```

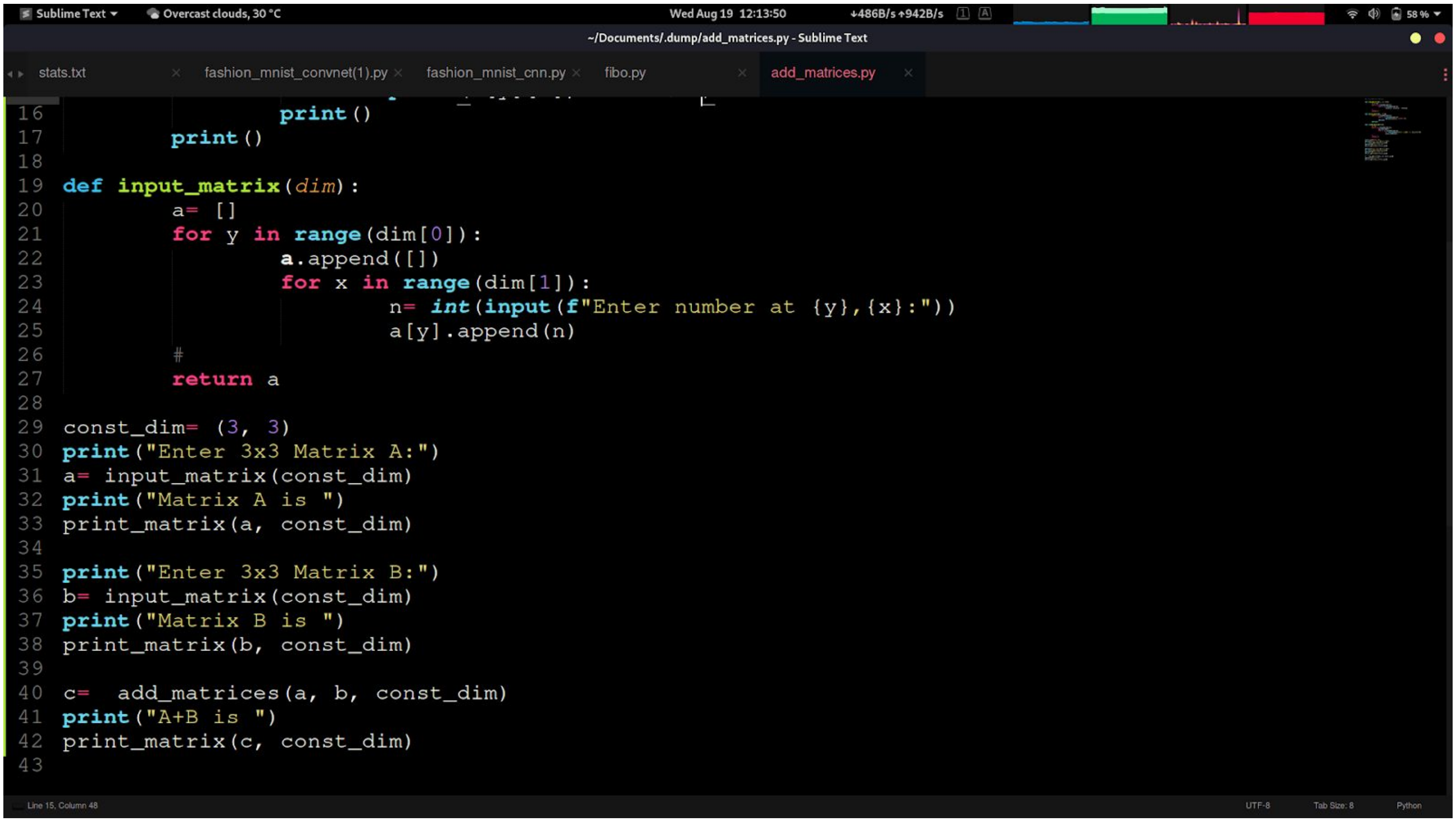


```
[felix@thunderchild .dump]$ python fibo.py
Enter the limit for Fibonacci sequence:89
0 1 1 2 3 5 8 13 21 34 55
[felix@thunderchild .dump]$ 
```

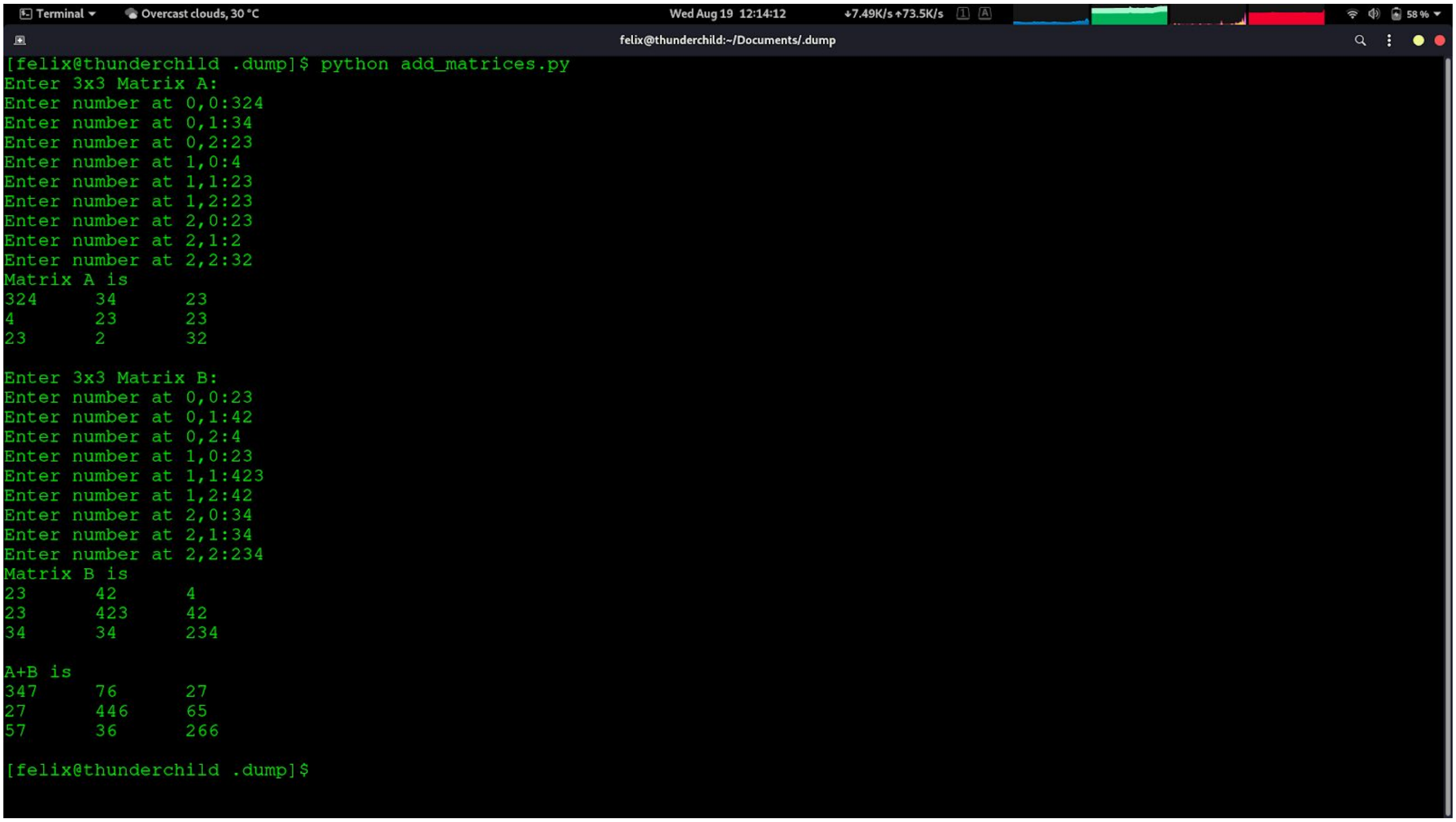
9. Python Program to Add Two Matrices



```python

#! /usr/bin/env python

def add_matrices(a, b, dim):
        c= [*b]
        for y in range(dim[0]):
                for x in range(dim[1]):
                        c[y][x]= a[y][x] + b[y][x]
        #
        return c

def print_matrix(a, dim):
        for y in range(dim[0]):
                for x in range(dim[1]):
                        print(a[y][x], end="\t")
                print()
        print()

def input_matrix(dim):
        a= []
        for y in range(dim[0]):
                a.append([])
                for x in range(dim[1]):
                        n= int(input(f"Enter number at {y},{x}:"))
                        a[y].append(n)
        #
        return a

const_dim= (3, 3)
```

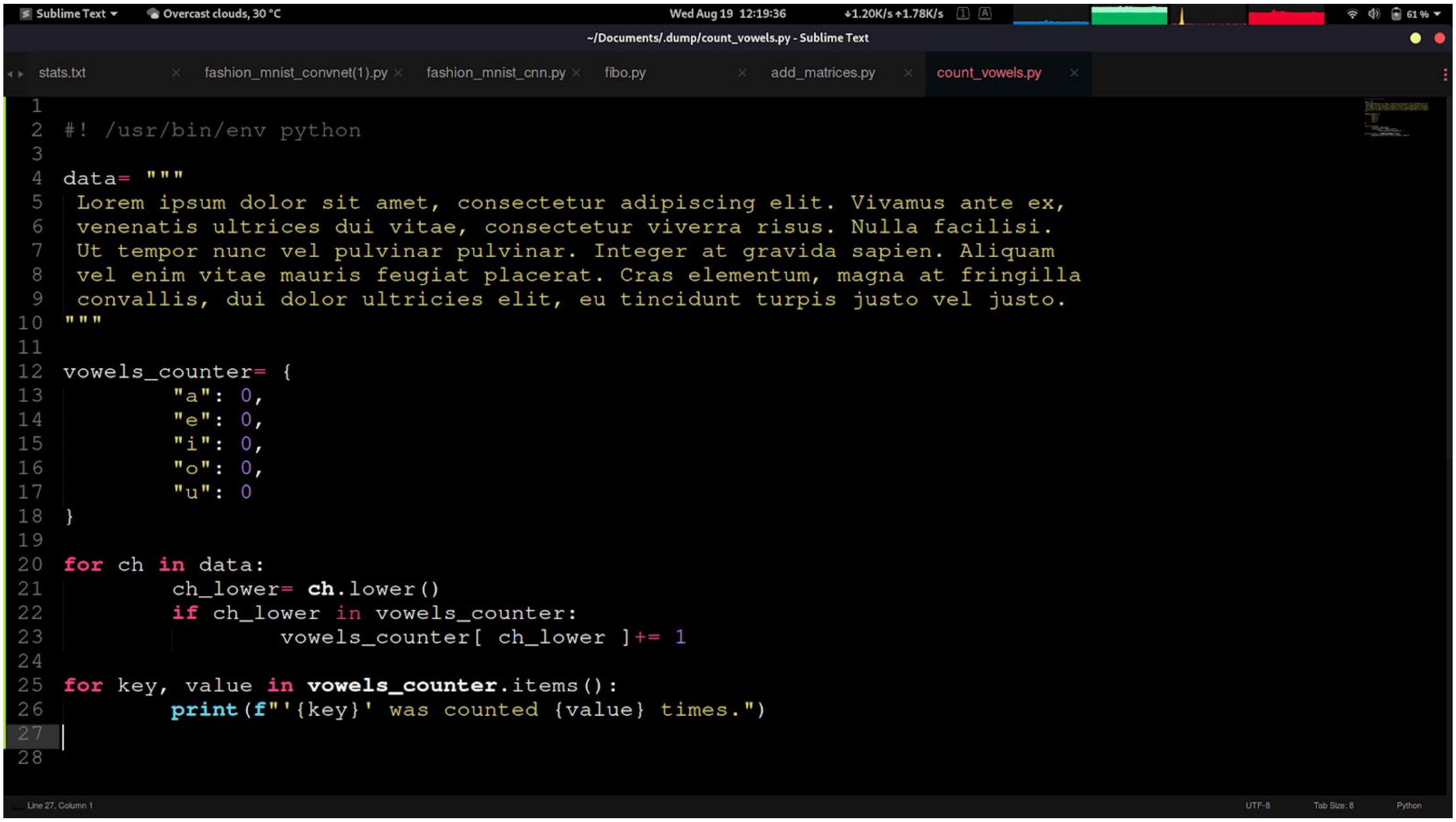


```python
                print()
        print()

def input_matrix(dim):
        a= []
        for y in range(dim[0]):
                a.append([])
                for x in range(dim[1]):
                        n= int(input(f"Enter number at {y},{x}:"))
                        a[y].append(n)
        #
        return a

const_dim= (3, 3)
print("Enter 3x3 Matrix A:")
a= input_matrix(const_dim)
print("Matrix A is ")
print_matrix(a, const_dim)

print("Enter 3x3 Matrix B:")
b= input_matrix(const_dim)
print("Matrix B is ")
print_matrix(b, const_dim)

c=  add_matrices(a, b, const_dim)
print("A+B is ")
print_matrix(c, const_dim)

```

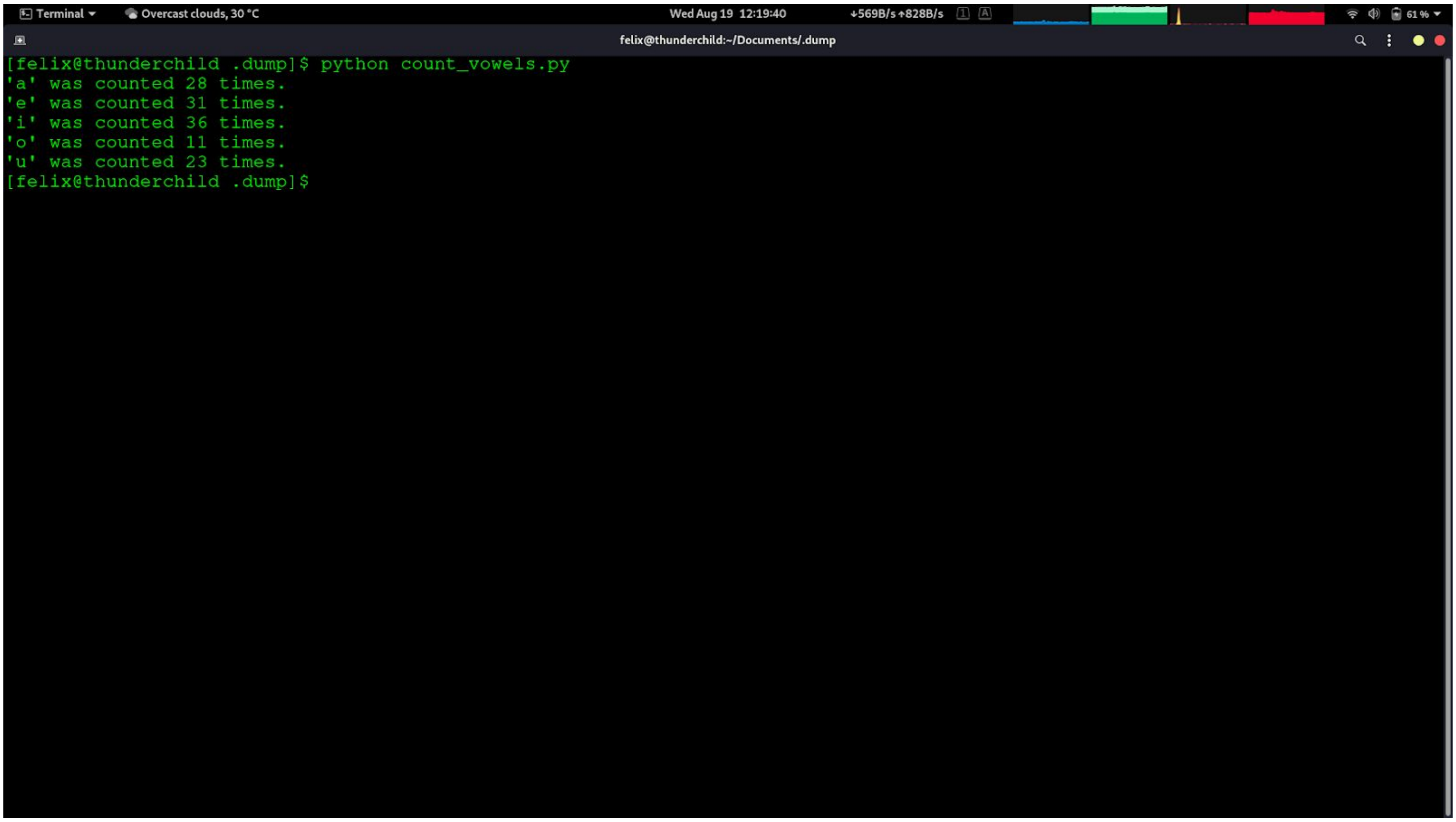


```
[felix@thunderchild .dump]$ python add_matrices.py
Enter 3x3 Matrix A:
Enter number at 0,0:324
Enter number at 0,1:34
Enter number at 0,2:23
Enter number at 1,0:4
Enter number at 1,1:23
Enter number at 1,2:23
Enter number at 2,0:23
Enter number at 2,1:2
Enter number at 2,2:32
Matrix A is
324     34      23
4       23      23
23      2       32

Enter 3x3 Matrix B:
Enter number at 0,0:23
Enter number at 0,1:42
Enter number at 0,2:4
Enter number at 1,0:23
Enter number at 1,1:423
Enter number at 1,2:42
Enter number at 2,0:34
Enter number at 2,1:34
Enter number at 2,2:234
Matrix B is
23      42      4
23      423     42
34      34      234

A+B is
347     76      27
27      446     65
57      36      266

[felix@thunderchild .dump]$
```

10. Python Program to Count the Number of Each Vowel



```python

#! /usr/bin/env python

data= """
 Lorem ipsum dolor sit amet, consectetur adipiscing elit. Vivamus ante ex,
 venenatis ultrices dui vitae, consectetur viverra risus. Nulla facilisi.
 Ut tempor nunc vel pulvinar pulvinar. Integer at gravida sapien. Aliquam
 vel enim vitae mauris feugiat placerat. Cras elementum, magna at fringilla
 convallis, dui dolor ultricies elit, eu tincidunt turpis justo vel justo.
"""

vowels_counter= {
        "a": 0,
        "e": 0,
        "i": 0,
        "o": 0,
        "u": 0
}

for ch in data:
        ch_lower= ch.lower()
        if ch_lower in vowels_counter:
                vowels_counter[ ch_lower ]+= 1

for key, value in vowels_counter.items():
        print(f"'{key}' was counted {value} times.")


```



```
[felix@thunderchild .dump]$ python count_vowels.py
'a' was counted 28 times.
'e' was counted 31 times.
'i' was counted 36 times.
'o' was counted 11 times.
'u' was counted 23 times.
[felix@thunderchild .dump]$
```