1. Write a Python program to calculate the area of a rectangle given its length and width.

```python
length=int(input('enter length :'))
width=int(input('enter width :'))
area=length*width
print('area of rectangle is',area)
```

```
Warning: PowerShell detected that you might be using a screen reader and has disabled PSReadLine for compatibility purposes. If you want to re-enable it, run 'Import-Module PSReadLine'.

PS D:\mine_\code files @@\pythonf> & "C:/Program Files/Python310/python.exe" "d:/mine_/code files @@/pythonf/test 3.py"
enter length :10
enter width :9
area of rectangle is 90
PS D:\mine_\code files @@\pythonf>
```
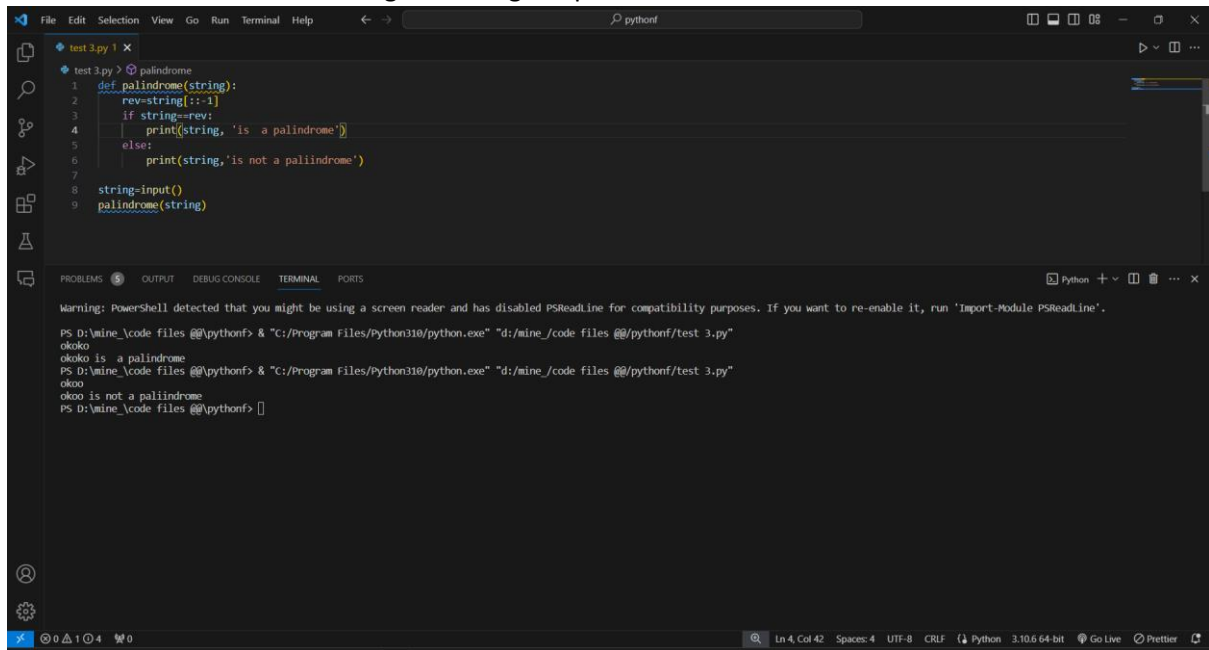
2. Write a program to convert miles to kilometers

```python
miles=int(input('enter miles :'))
kilometers = miles * 1.60934
print(kilometers)
```

```
Warning: PowerShell detected that you might be using a screen reader and has disabled PSReadLine for compatibility purposes. If you want to re-enable it, run 'Import-Module PSReadLine'.

PS D:\mine_\code files @@\pythonf> & "C:/Program Files/Python310/python.exe" "d:/mine_/code files @@/pythonf/test 3.py"
enter miles :10
16.0934
PS D:\mine_\code files @@\pythonf>
PS D:\mine_\code files @@\pythonf>
```
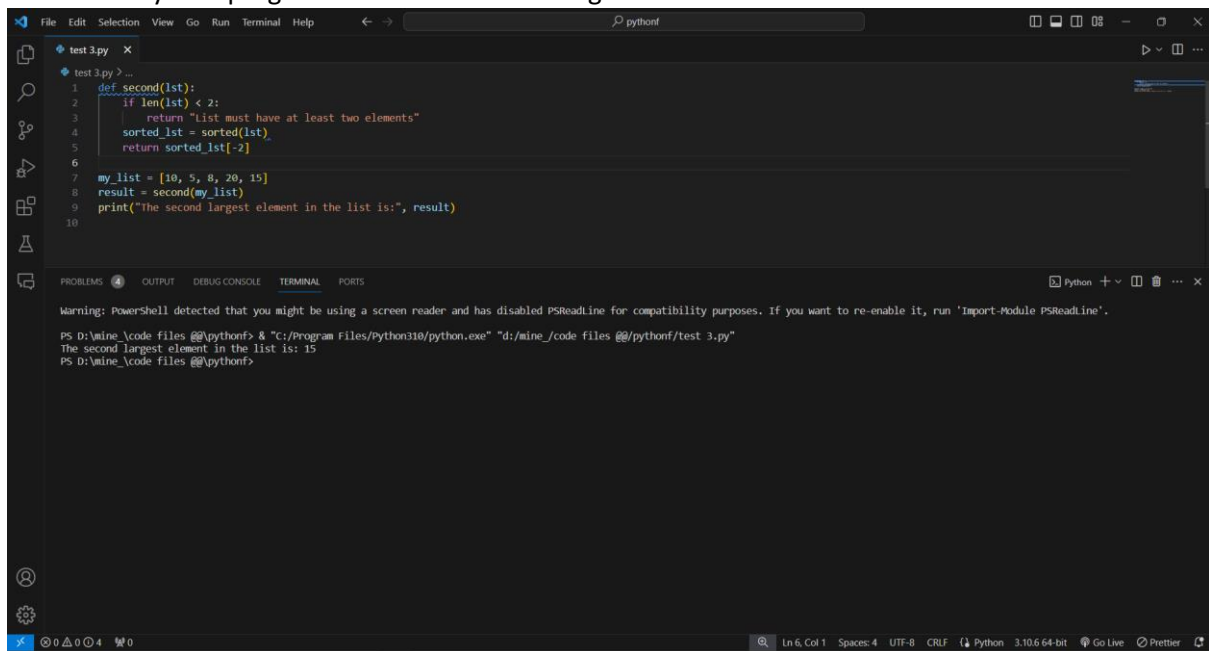
3. Write a function to check if a given string is a palindrome

.

4. Write a Python program to find the second largest element in a list.
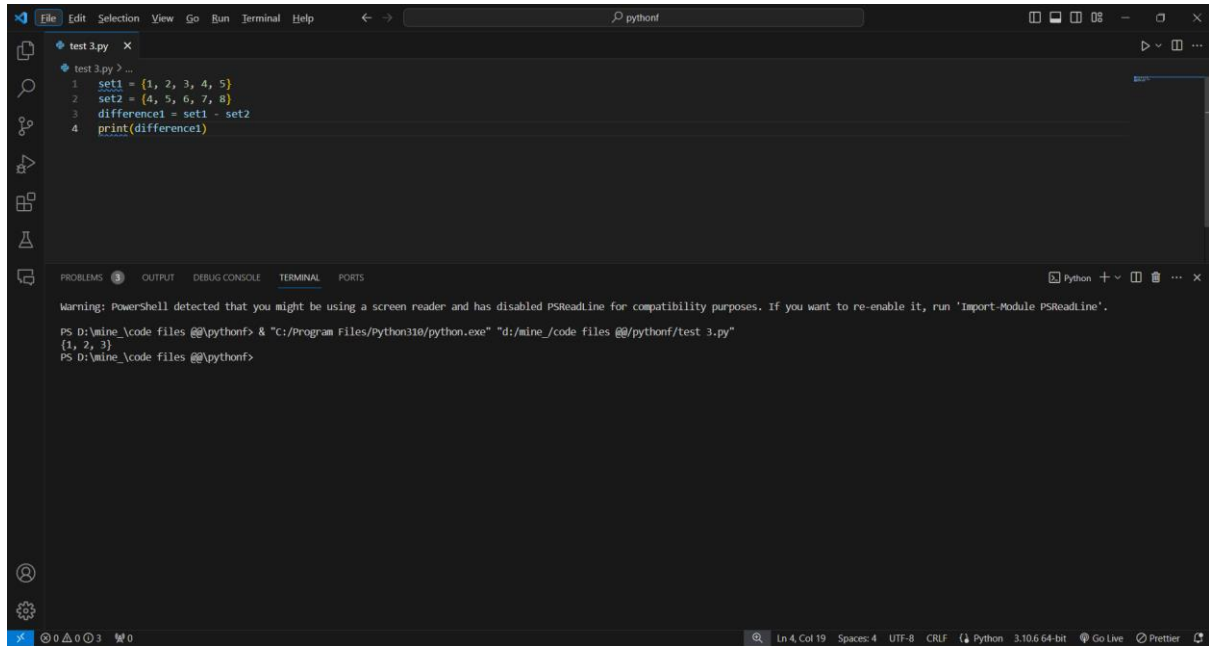

5. Explain what indentation means in Python.

Ans: Indentation is a space used to represent the block of code or statements in python. In the other programming languages like c,c++,java we use the { } curly braces to represent the block of code

for example :

```
for i in range(10):

    print(i)
```

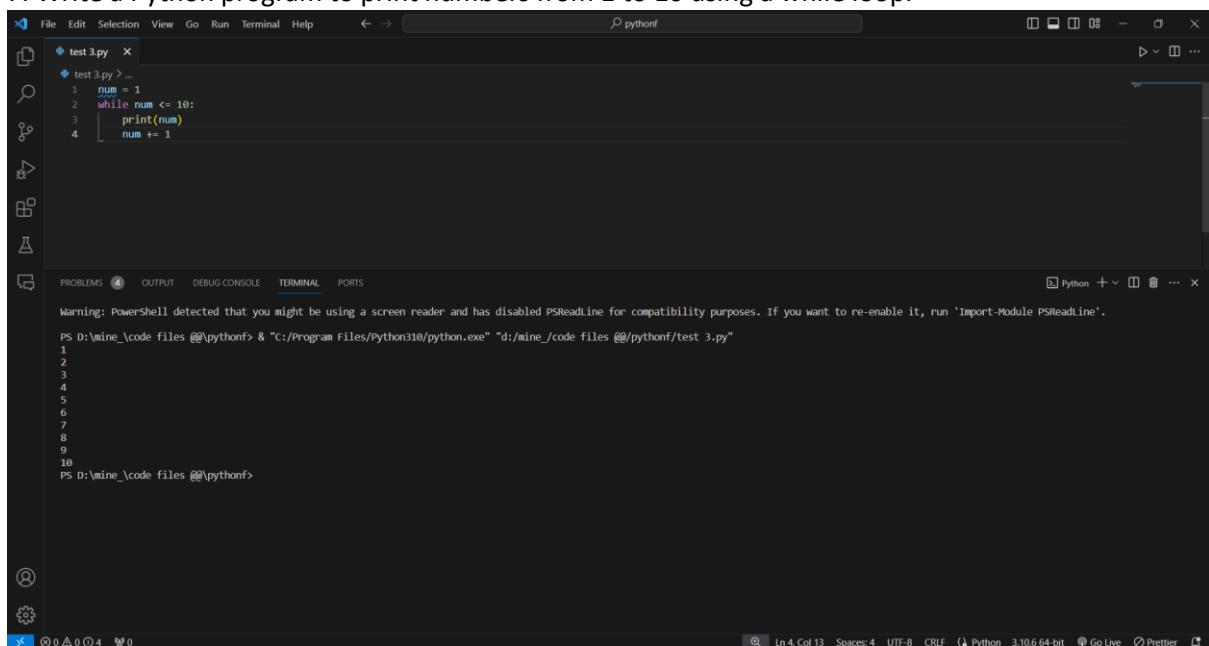## 6. Write a program to perform set difference operation.

```python
set1 = {1, 2, 3, 4, 5}
set2 = {4, 5, 6, 7, 8}
difference1 = set1 - set2
print(difference1)
```

Terminal output:

```
Warning: PowerShell detected that you might be using a screen reader and has disabled PSReadLine for compatibility purposes. If you want to re-enable it, run 'Import-Module PSReadLine'.

PS D:\mine_\code files @@\pythonf> & "C:/Program Files/Python310/python.exe" "d:/mine_/code files @@/pythonf/test 3.py"
{1, 2, 3}
PS D:\mine_\code files @@\pythonf>
```

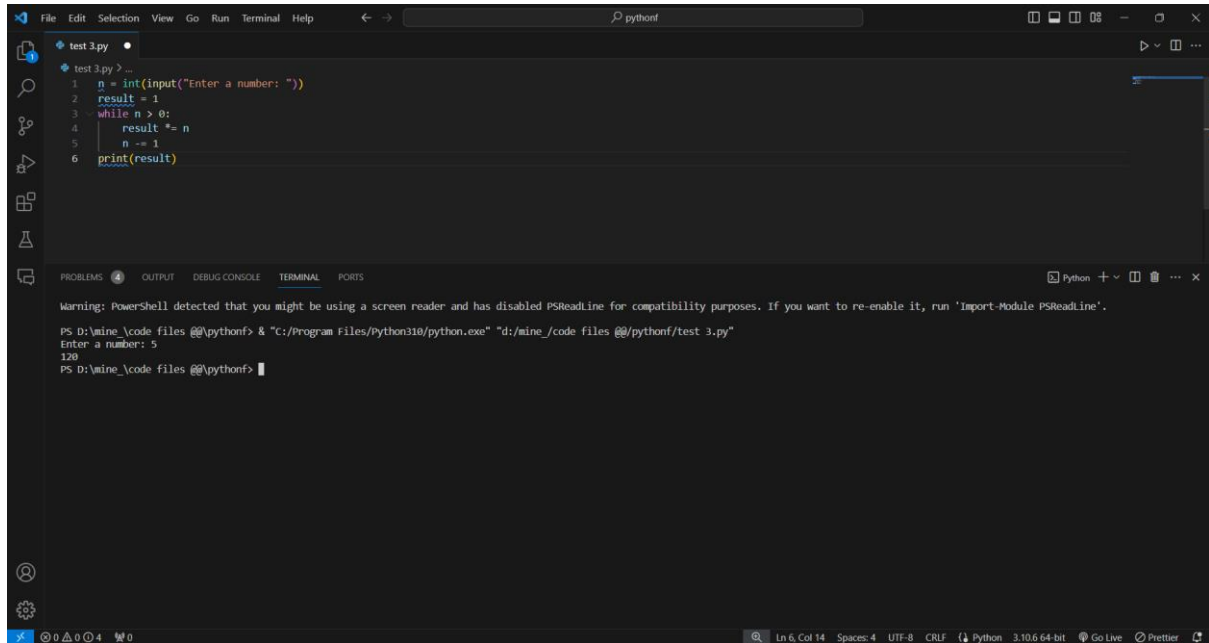## 7. Write a Python program to print numbers from 1 to 10 using a while loop.

```python
num = 1
while num <= 10:
    print(num)
    num += 1
```

Terminal output:

```
Warning: PowerShell detected that you might be using a screen reader and has disabled PSReadLine for compatibility purposes. If you want to re-enable it, run 'Import-Module PSReadLine'.

PS D:\mine_\code files @@\pythonf> & "C:/Program Files/Python310/python.exe" "d:/mine_/code files @@/pythonf/test 3.py"
1
2
3
4
5
6
7
8
9
10
PS D:\mine_\code files @@\pythonf>
```

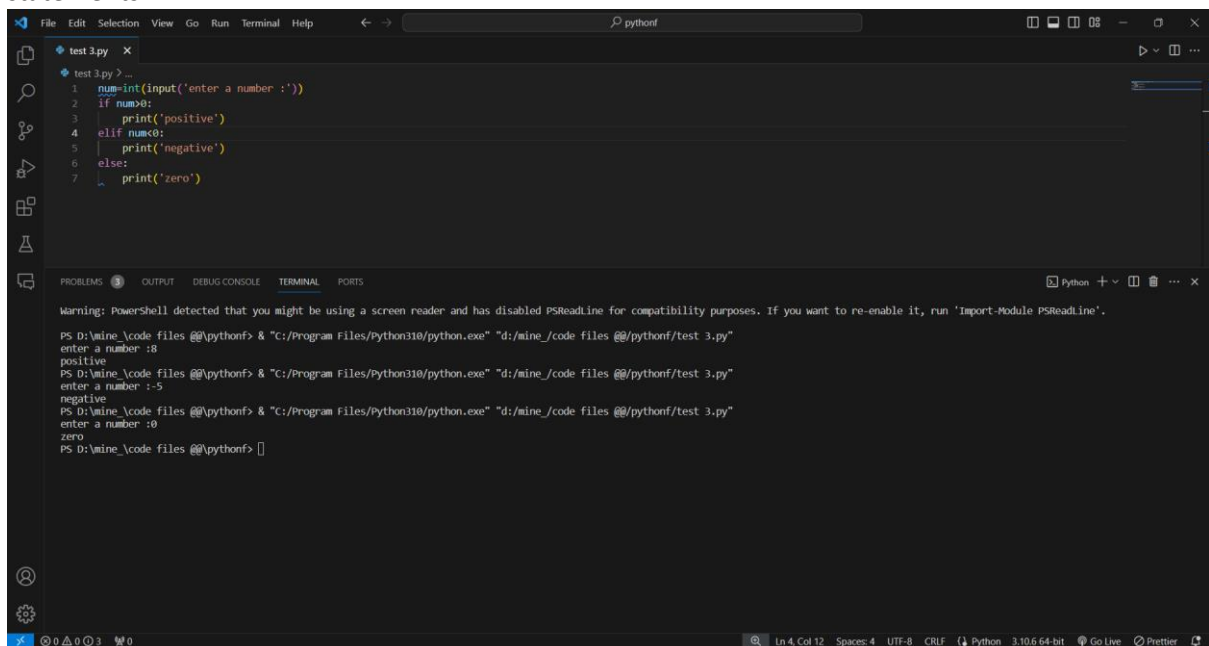8. Write a program to calculate the factorial of a number using a while loop.

```python
n = int(input("Enter a number: "))
result = 1
while n > 0:
    result *= n
    n -= 1
print(result)
```

```
Warning: PowerShell detected that you might be using a screen reader and has disabled PSReadLine for compatibility purposes. If you want to re-enable it, run 'Import-Module PSReadLine'.

PS D:\mine_\code files @@\pythonf> & "C:/Program Files/Python310/python.exe" "d:/mine_/code files @@/pythonf/test 3.py"
Enter a number: 5
120
PS D:\mine_\code files @@\pythonf>
```

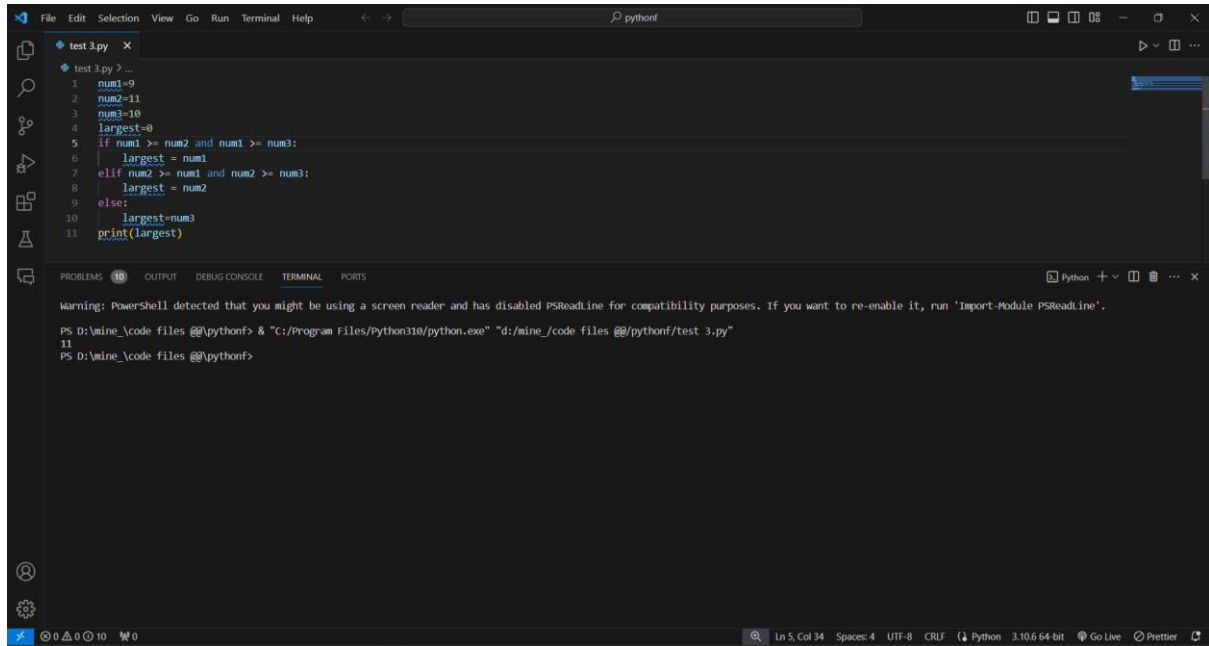9. Write a Python program to check if a number is positive, negative, or zero using if-elif-else statements.

```python
num=int(input('enter a number :'))
if num>0:
    print('positive')
elif num<0:
    print('negative')
else:
    print('zero')
```

```
Warning: PowerShell detected that you might be using a screen reader and has disabled PSReadLine for compatibility purposes. If you want to re-enable it, run 'Import-Module PSReadLine'.

PS D:\mine_\code files @@\pythonf> & "C:/Program Files/Python310/python.exe" "d:/mine_/code files @@/pythonf/test 3.py"
enter a number :8
positive
PS D:\mine_\code files @@\pythonf> & "C:/Program Files/Python310/python.exe" "d:/mine_/code files @@/pythonf/test 3.py"
enter a number :-5
negative
PS D:\mine_\code files @@\pythonf> & "C:/Program Files/Python310/python.exe" "d:/mine_/code files @@/pythonf/test 3.py"
enter a number :0
zero
PS D:\mine_\code files @@\pythonf>
```

10. Write a program to determine the largest among three numbers using conditional statements.
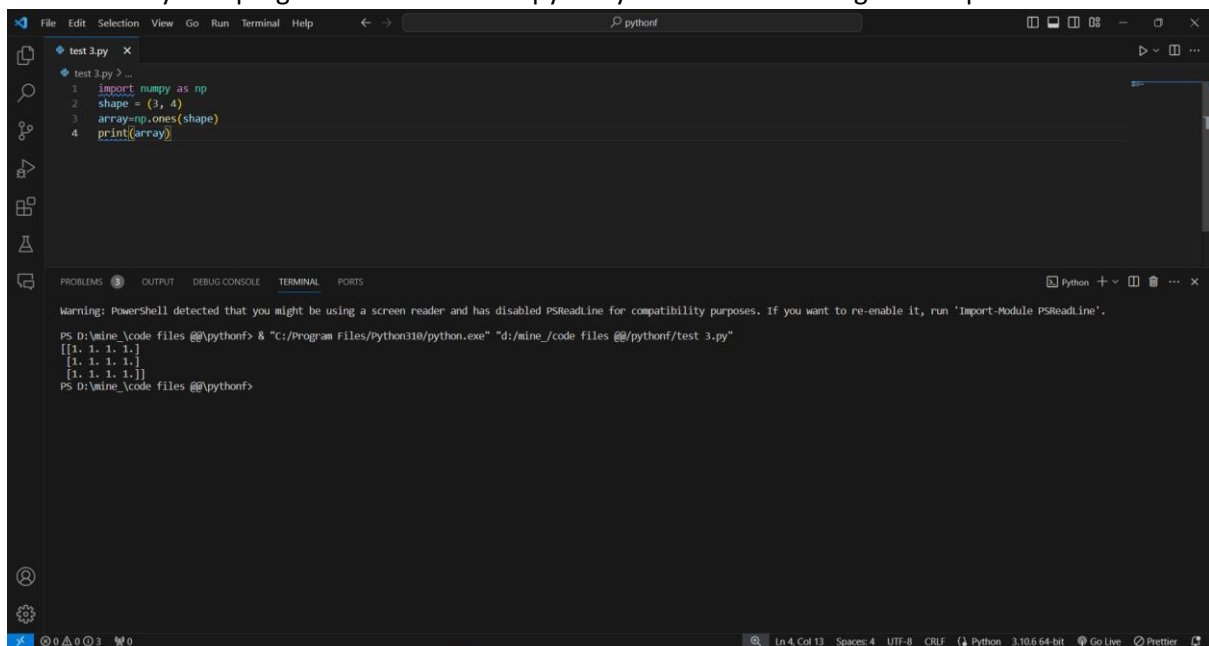
```python
num1=9
num2=11
num3=10
largest=0
if num1 >= num2 and num1 >= num3:
    largest = num1
elif num2 >= num1 and num2 >= num3:
    largest = num2
else:
    largest=num3
print(largest)
```

Warning: PowerShell detected that you might be using a screen reader and has disabled PSReadLine for compatibility purposes. If you want to re-enable it, run 'Import-Module PSReadLine'.

PS D:\mine_\code files @@\pythonf> & "C:/Program Files/Python310/python.exe" "d:/mine_/code files @@/pythonf/test 3.py"
11
PS D:\mine_\code files @@\pythonf>

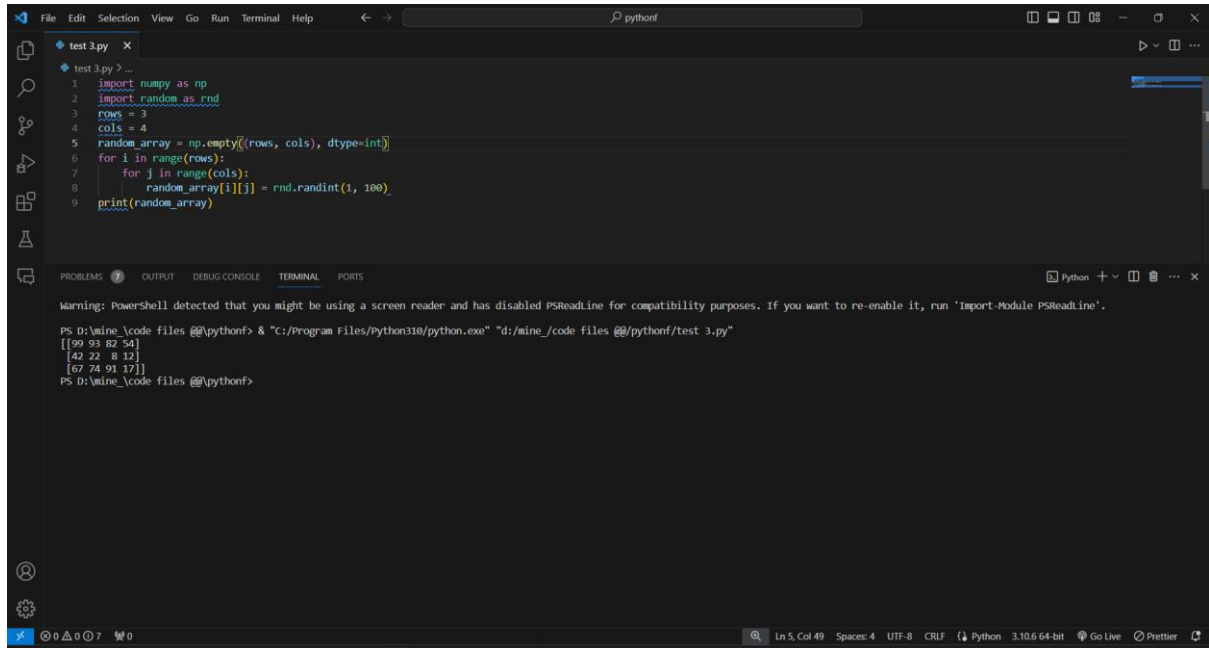11. Write a Python program to create a numpy array filled with ones of given shape.

```python
import numpy as np
shape = (3, 4)
array=np.ones(shape)
print(array)
```

Warning: PowerShell detected that you might be using a screen reader and has disabled PSReadLine for compatibility purposes. If you want to re-enable it, run 'Import-Module PSReadLine'.

PS D:\mine_\code files @@\pythonf> & "C:/Program Files/Python310/python.exe" "d:/mine_/code files @@/pythonf/test 3.py"
[[1. 1. 1. 1.]
 [1. 1. 1. 1.]
 [1. 1. 1. 1.]]
PS D:\mine_\code files @@\pythonf>

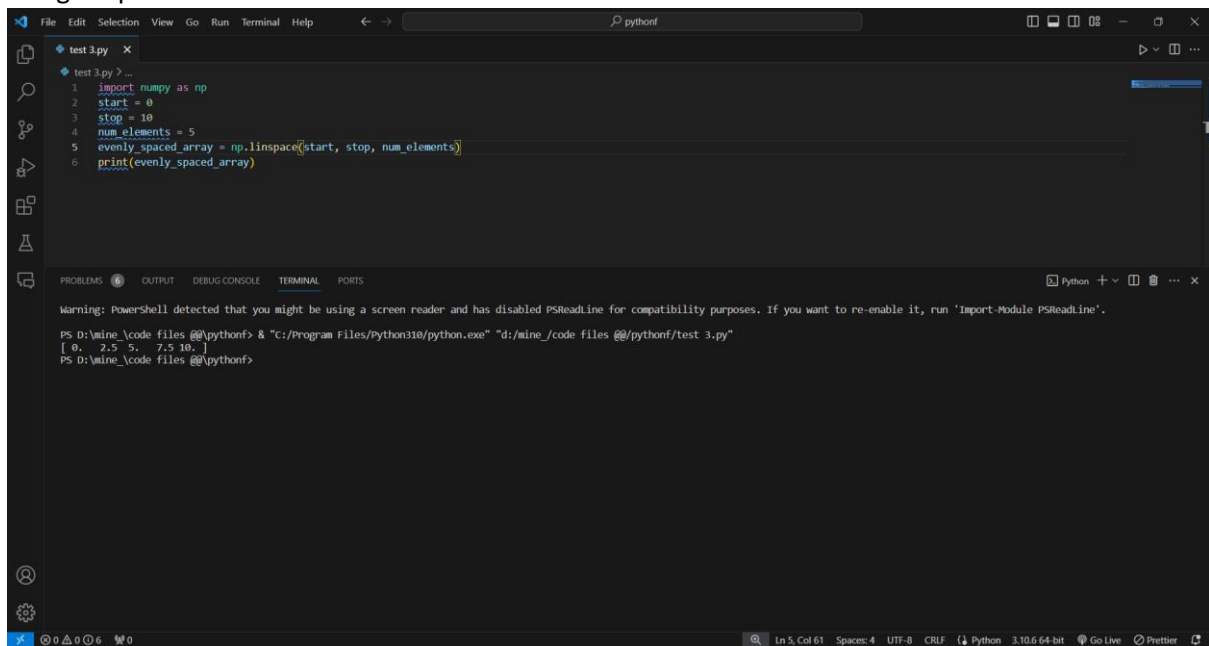## 12. Write a program to create a 2D numpy array initialized with random integers.

```python
import numpy as np
import random as rnd
rows = 3
cols = 4
random_array = np.empty((rows, cols), dtype=int)
for i in range(rows):
    for j in range(cols):
        random_array[i][j] = rnd.randint(1, 100)
print(random_array)
```

```
Warning: PowerShell detected that you might be using a screen reader and has disabled PSReadLine for compatibility purposes. If you want to re-enable it, run 'Import-Module PSReadLine'.

PS D:\mine_\code files @@\pythonf> & "C:/Program Files/Python310/python.exe" "d:/mine_/code files @@/pythonf/test 3.py"
[[99 93 82 54]
 [42 22  8 12]
 [67 74 91 17]]
PS D:\mine_\code files @@\pythonf>
```

13. Write a Python program to generate an array of evenly spaced numbers over a specified range using linspace.
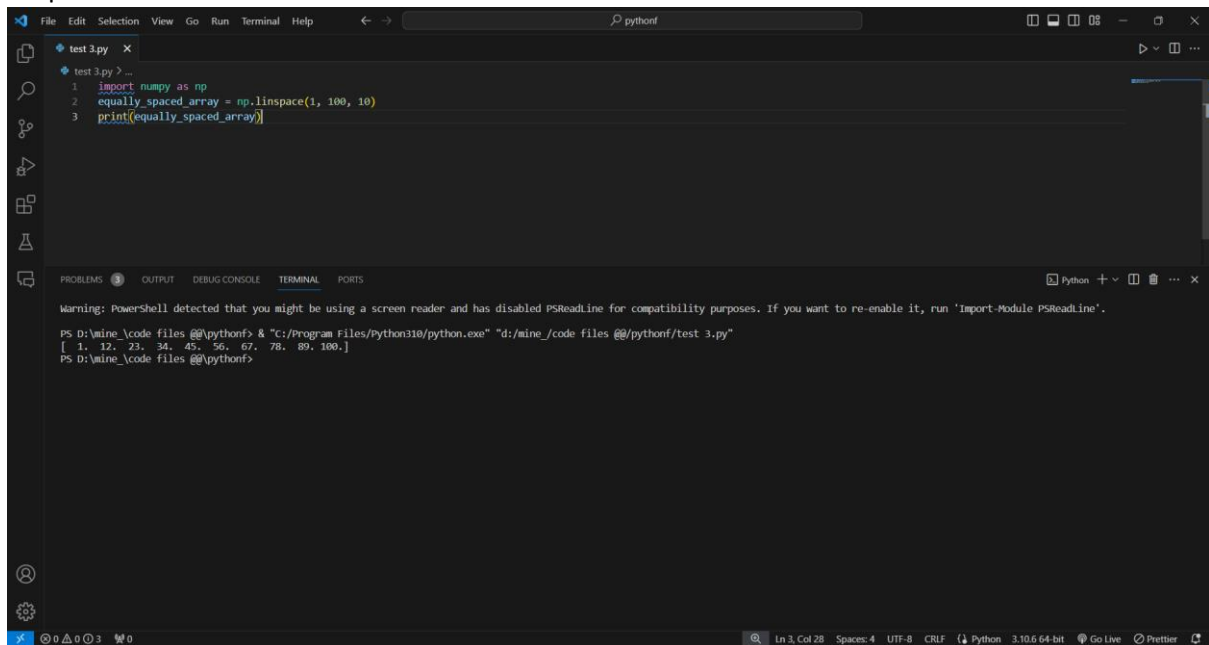
```python
import numpy as np
start = 0
stop = 10
num_elements = 5
evenly_spaced_array = np.linspace(start, stop, num_elements)
print(evenly_spaced_array)
```

```
Warning: PowerShell detected that you might be using a screen reader and has disabled PSReadLine for compatibility purposes. If you want to re-enable it, run 'Import-Module PSReadLine'.

PS D:\mine_\code files @@\pythonf> & "C:/Program Files/Python310/python.exe" "d:/mine_/code files @@/pythonf/test 3.py"
[ 0.   2.5  5.   7.5 10. ]
PS D:\mine_\code files @@\pythonf>
```

14. Write a program to generate an array of 10 equally spaced values between 1 and 100 using linspace.
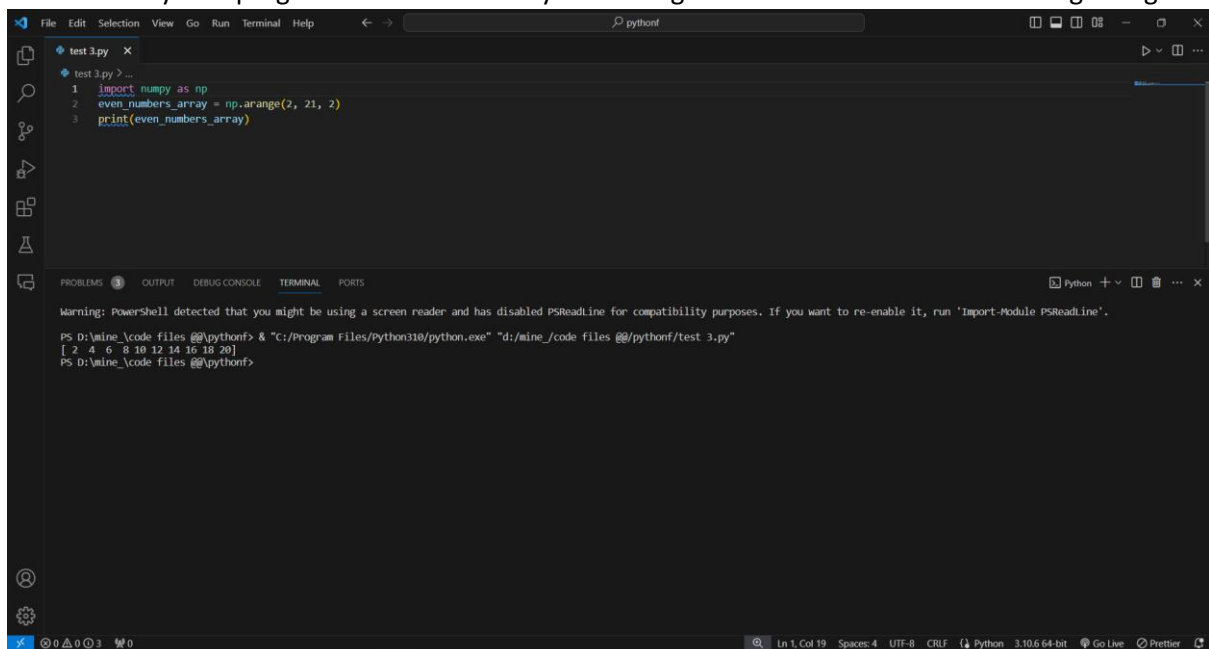
```python
import numpy as np
equally_spaced_array = np.linspace(1, 100, 10)
print(equally_spaced_array)
```

```
Warning: PowerShell detected that you might be using a screen reader and has disabled PSReadLine for compatibility purposes. If you want to re-enable it, run 'Import-Module PSReadLine'.

PS D:\mine_\code files @@\pythonf> & "C:/Program Files/Python310/python.exe" "d:/mine_/code files @@/pythonf/test 3.py"
[  1.  12.  23.  34.  45.  56.  67.  78.  89. 100.]
PS D:\mine_\code files @@\pythonf>
```

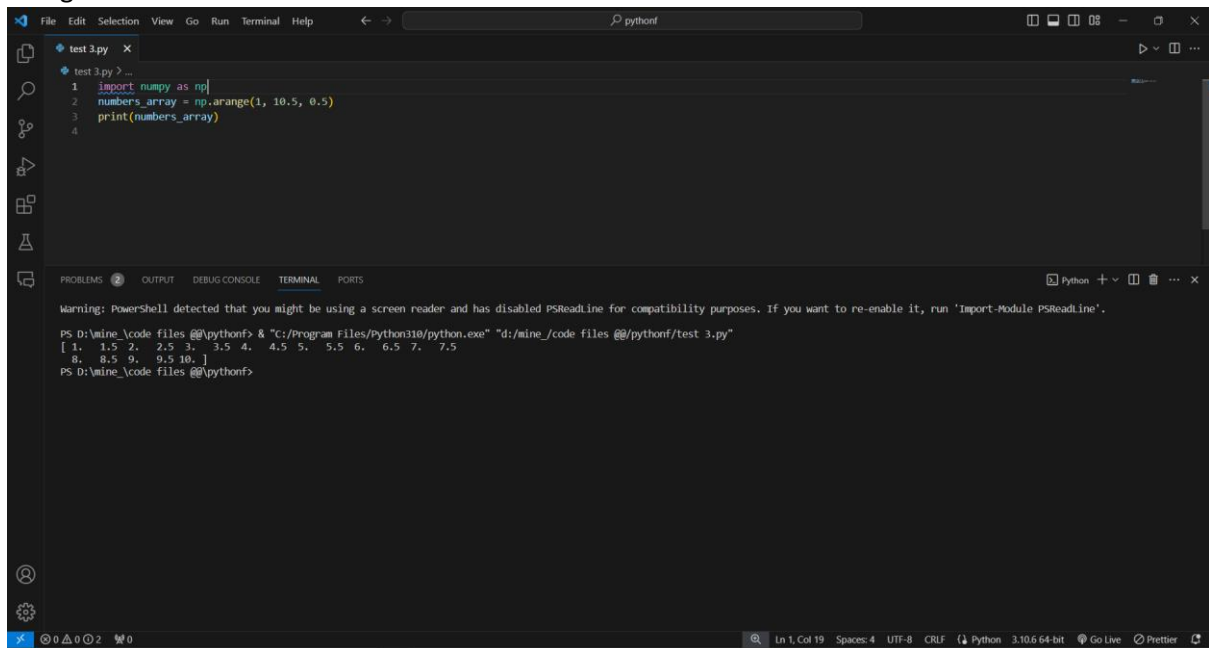15. Write a Python program to create an array containing even numbers from 2 to 20 using arange.

```python
import numpy as np
even_numbers_array = np.arange(2, 21, 2)
print(even_numbers_array)
```

```
Warning: PowerShell detected that you might be using a screen reader and has disabled PSReadLine for compatibility purposes. If you want to re-enable it, run 'Import-Module PSReadLine'.

PS D:\mine_\code files @@\pythonf> & "C:/Program Files/Python310/python.exe" "d:/mine_/code files @@/pythonf/test 3.py"
[ 2  4  6  8 10 12 14 16 18 20]
PS D:\mine_\code files @@\pythonf>
```

16. Write a program to create an array containing numbers from 1 to 10 with a step size of 0.5 using arange.