Assignment -1

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

```
In [1]: #Write a Python program to calculate the area of a rectangle given its length and width.

In [2]: length= int(input("Enter the length of the rectangle"))
        width = int(input("Enter the width of the rectangle"))
        area=length*width
        print("The area of the rectangle is",area)

        Enter the length of the rectangle5
        Enter the width of the rectangle7
        The area of the rectangle is 35
```

2)Write a program to convert miles to kilometers

```
[3]: #Write a program to convert miles to kilometers

[4]: miles=float(input("Enter the miles"))
     kilometers=miles*1.6
     print("The kilometers is",kilometers)

     Enter the miles5
     The kilometers is 8.0
```

3)Write a function to check if a given string is a palindrome.

```
#Write a function to check if a given string is a palindrome

def palindrome(string):
    if(string==string[::-1]):
        print("palindrome")
    else:
        print("Not a Palindrome")

string=input()
palindrome(string)
```

```
eat
Not a Palindrome
```

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

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

```
List=list(map(int,input().split(" ")))
List=sorted(List)
print(List[-2])
```

```
1 3 4 7 8
7
```

5)Explain what indentation means in python

In Python, Indentation is used to define the structure of code. Unlike many other programming languages, which often use curly braces or other symbols to indicate blocks of code.

It defines the structure of code blocks such as loops, conditional statements, function definitions, class definitions, etc. Blocks of code at the same level of indentation are considered to be part of the same block or scope.

It makes the code easier to understand and follow, especially for beginners or when revisiting code after a long time.

Unlike languages like C, Java, or JavaScript, Python doesn't use delimiters like braces {} to mark the beginning and end of blocks. Instead, it relies solely on indentation to determine the scope of code blocks.

Incorrect indentation can lead to syntax errors or alter the logical structure of the program.

6) Write a program to perform set difference operation.

```
#Write a program to perform set difference operation
```

```
set1 ={1,2,3,4,5}
set2 ={2,4,6,8,0}
res=set1-set2
print("The set difference is",res)
```

```
The set difference is {1, 3, 5}
```

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

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

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

```
1
2
3
4
5
6
7
8
9
10
```

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

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

```
N=int(input("Enter the number"))
Factorial=1
while N>1:
   Factorial=Factorial*N
   N=N-1
print(Factorial)
```

```
Enter the number5
120
```

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

```
In [1]: #Write a Python program to check if a number is positive, negative, or zero using if-elif-else statements.
```

```
In [2]: num=eval(input("Enter the number"))
        if(num>0):
            print("Positive")
        elif(num<0):
            print("Negative")
        else:
            print("Zero")
```

```
Enter the number-7
Negative
```

10)Write a program to determine the largest among three numbers using conditional statements.

```
#Write a program to determine the largest among three numbers using conditionalstatements.
```

```
def findlargest(num1, num2, num3):
    if num1 >= num2 and num1 >= num3:
        return num1
    elif num2 >= num1 and num2 >= num3:
        return num2
    else:
        return num3

num1 = float(input("Enter the first number: "))
num2 = float(input("Enter the second number: "))
num3 = float(input("Enter the third number: "))

largest = findlargest(num1, num2, num3)
print("The largest number is:", largest)
```

```
Enter the first number: 78
Enter the second number: 43
Enter the third number: 21
The largest number is: 78.0
```

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

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

```
import numpy as np
shape = (3, 4)
ones_array = np.ones(shape)
print("Array of ones with shape", shape, ":\n", ones_array)
```

```
Array of ones with shape (3, 4) :
 [[1. 1. 1. 1.]
 [1. 1. 1. 1.]
 [1. 1. 1. 1.]]
```

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

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

```
import numpy as np
rows = int(input("Enter the number of rows: "))
cols = int(input("Enter the number of columns: "))
array_2d = np.random.randint(low=0, high=100, size=(rows, cols))
print(array_2d)
```

```
Enter the number of rows: 4
Enter the number of columns: 4
[[30 11 29 15]
 [ 3 84 91 26]
 [16 51 67 13]
 [27 58 89 77]]
```

13) Write a Python program to generate an array of evenly spaced numbers over a specified range using linspace.

```
#Write a program to generate an array of 10 equally spaced values between 1 and 100 using linspace.
```

```
import numpy as np
start = float(input("Enter the start value: "))
stop = float(input("Enter the stop value: "))
numvalues = int(input("Enter the number of values: "))
arr = np.linspace(start, stop, numvalues)
print(arr)
```

```
Enter the start value: 2.0
Enter the stop value: 5.0
Enter the number of values: 10
[2.         2.33333333 2.66666667 3.         3.33333333 3.66666667
 4.         4.33333333 4.66666667 5.        ]
```

14) Write a program to generate an array of 10 equally spaced values between 1 and 100 using line space.

```
#Write a program to generate an array of 10 equally spaced values between 1 and 100 using linespace.
```

```
import numpy as np
arr = np.linspace(1, 100, 10)
print(arr)
```

```
[  1.  12.  23.  34.  45.  56.  67.  78.  89. 100.]
```

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

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

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

```
[ 2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20]
```

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

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

```
import numpy as np
arr = np.arange(1, 10.5 ,0.5)
print(arr)
```

```
[ 1.   1.5  2.   2.5  3.   3.5  4.   4.5  5.   5.5  6.   6.5  7.   7.5
  8.   8.5  9.   9.5 10. ]
```