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

```
width=int(input())
length=int(input())
area=width*length
print("area of rectangle:",area)
```

```
4
5
area of rectangle: 20
```

2)Write a program to convert miles to kilometers

```
mile=int(input())
kilometer=1.609*mile
print(kilometer)
```

```
8
12.872
```

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

```
def ispalindrome(s):
  str1=s[::-1]
  if str1==s:
    print("the string is palindrome")
  else:
    print("not palindrome")
s_name=input()
ispalindrome(s_name)
```

```
madam
the string is palindrome
```

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

```
a=[]
n=int(input())
for i in range(n):
  c=int(input())
  a.append(c)
a.sort()
print("the second largest element in list",
```

```
3
2
5
4
the second largest element in list 4
```

5)Explain what indentation means in Python.

In Python, indentation is used to indicate a block of code. It is the space at the beginning of a code line that determines the grouping and hierarchy of statements

Eg:

```
if name==manoj:
    print(“hi manoj”)
```

6. Write a program to perform set difference operation

```
s1={1,25,'manoj','vamsi'}
s2={19,20,"pavan","priyanka"}
#adding element to set
s1.add("A,P")
s2.add("M")
print(s1,s2)
#update
s1.update(s2)
print(s1)
```

```
{1, 'manoj', 'A,P', 'vamsi', 25} {'M', 'priyanka', 19, 20, 'pavan'}
{1, 'M', 'manoj', 'priyanka', 'A,P', 19, 20, 'vamsi', 'pavan', 25}
```

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

```
n=10
i=1
while n:
  print(i)
  i+=1
  n=n-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.

```
n=int(input())
fact=1
if n==0:
  print(fact)
else:
  while n:
    fact=fact*n
    n=n-1
  print(fact)


5
120
```

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

```
n=int(input())
if n==0:
  print("zero")
elif n>0:
  print("postive")
else:
  print("negative")

5
postive
```

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

```
a=int(input())
b=int(input())
c=int(input())
if a>b and a>c:
  print("the larget number is :",a)
elif b>c:
   print("the larget number is :",b)
else:
   print("the larget number is :",c)
```

```
5
6
4
the larget number is : 6
```

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

```
import numpy as np
n=int(input())
np.ones((n,n))
```

```
5
array([[1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1.],
       [1., 1., 1., 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

```
import numpy as np
arr=np.array([[1,2,4,5],[3,6,7,8]])
arr
```

```
array([[1, 2, 4, 5],
       [3, 6, 7, 8]])
```

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

```
import numpy as np
arr=np.linspace(1,9,20)
arr
```

```
array([1.        , 1.42105263, 1.84210526, 2.26315789, 2.68421053,
       3.10526316, 3.52631579, 3.94736842, 4.36842105, 4.78947368,
       5.21052632, 5.63157895, 6.05263158, 6.47368421, 6.89473684,
       7.31578947, 7.73684211, 8.15789474, 8.57894737, 9.        ])
```

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

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

```
array([  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 arange.

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

```
array([ 2,  4,  6,  8, 10, 12, 14, 16, 18, 20])
```

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

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

```
array([ 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. ])
```