1. What is a List?

1.list is a one data type in python

2.list is a collection of item.like[int,float,complex,string,tuple,series,.... Dataframe]

3.list is mutable datatype . i,e ehich change or update the value of item.

4.list allowed duplicated item.

5.list are enclosed by parenthesis called Square bracket >> []

5.list is comma sepearted.

6.list is define by square bracket[] list1=[1,2,3,4] also can define list e.g list1=list()

7.list is ordered in nature.

8.list is used to store squence of various data type(refer point 2)

2. What is a Tuple?

1.tuple is immutable datatype.i.e the value are store in tuple are cannot be modified/change.

2.tuple is ordered data type.

3.tuple are used to store the sequence.

4.tuple are enclosed by parenthesis called round bracket >> (())

5.tuple are hetrogenous datatype(int,float,complex,string,list ....)

6.comma seperated tuple are faster than list.

7.we cannot dp operation like add ,update , delete

8.if we are adding one item in tuple need to add comma

3. What is the difference between List and Tuple?

list

1.list is a one data type in python

2.list is mutable datatype . i,e ehich change or update the value of item.

3.list are enclosed by parenthesis called Square bracket >> []

4.list is define by square bracket[] list1=[1,2,3,4] also can define list e.g list1=list()

5.list is slower than tuple.

6.list is less memory effiecient

7.list has varible length.

TUPLE

1.tuple is a one data type in python

2.tuple is immutable datatype . i,e which cannot change or update the value of item.

3.tuple are enclosed by parenthesis called Square bracket >> []

4.tuple is faster than list.

5.list is define by square bracket(), list1=(1,2,3,4) also can define list e.g list1=tuple()

6.list is more memory effiecient

7.list has fixed length.

4. Python Program to find the largest element in the list

In [5]:
```
# method 1:

list1=[2,5,7,93,6,35,76,9]
largest_num=max(list1)
print(largest_num)
```

```
93
```

In [8]:
```
# method 2 :

list1=[2,5,7,93,6,35,76,9]
largest_num=-32567


for item in list1:
    if item>largest_num:
        largest_num=item

    else:
        pass
print(largest_num)
```

```
93
```

5. Python program to interchange first and last

elements in a list

In [9]:
```
list1=[2,5,7,93,6,35,76,9]

first=list1[0]
last=list1[-1]
list1[0]=last
list1[-1]=first

print(list1)
```

```
[9, 5, 7, 93, 6, 35, 76, 2]
```

6. Python program to swap two elements in a list

In [10]:
```
# first method
list1=[2,5,7,93,6,35,76,9]

first=list1[0]
last=list1[-1]
list1[0]=last
list1[-1]=first

print(list1)
```

```
[9, 5, 7, 93, 6, 35, 76, 2]
```

In [13]:
```
# second method
l1 = [2,5,3,'string',58,'python']
l1[2],l1[3] = l1[3],l1[2]
print("After swaping to two element list is :",l1)
```

```
After swaping to two element list is : [2, 5, 'string', 3, 58, 'python']
```

7. Python program to Reverse a List

In [19]:
```
# first approach using sort()

list1=[2,5,7,93,6,35,76,9]

list1.sort(reverse=True)

print(list1)
```

```
[93, 76, 35, 9, 7, 6, 5, 2]
```

In [20]:
```
# second approach using reverse()

list1=[2,5,7,93,6,35,76,9]

list1.reverse()

print(list1)
```

```
[9, 76, 35, 6, 93, 7, 5, 2]
```

In [14]:
```
# Third Approach is reversed()

list1=[1,2,3,4,5,67,8]

list2=reversed(list1)

print(list2)
```

```
<list_reverseiterator object at 0x00000268992DCB00>
```

In [16]:
```
# fourth method
list1=[2,5,7,93,6,35,76,9]
print(list1[::-1])
```

```
[9, 76, 35, 6, 93, 7, 5, 2]
```

8. Python program to count occurrences of an element in a list

In [31]:
```
# 8. Python program to count occurrences of an element in a list

list1=[2,3,4,5,"python",12.3,43.2,"data",[2,3]]
count=0
for item in list1:
    count +=1
print(count)
```

```
9
```

In [20]:
```
list1=[2,2,3,3,3,3,3,4,5,"python",12.3,43.2,"data",[2,3]]
for i in list1:
    print(f"count of {i} inlist {list1.count(i)}")
```

```
count of 2 inlist 2
count of 2 inlist 2
count of 3 inlist 5
count of 3 inlist 5
count of 3 inlist 5
count of 3 inlist 5
count of 3 inlist 5
count of 4 inlist 1
count of 5 inlist 1
count of python inlist 1
count of 12.3 inlist 1
count of 43.2 inlist 1
count of data inlist 1
count of [2, 3] inlist 1
```

9. Python program to find the sum of elements in a list

In [32]:
```
# first approach using built in function sum()
list1=[2,3,4,5,12.3,43.2]
print(sum(list1))
```

```
69.5
```

In [33]:
```
# second approach using loop

list1=[2,3,4,5,12.3,43.2]
total=0
for item in list1:
    total +=item
print(total)
```

```
69.5
```

10. Python program to Multiply all numbers in the list

In [36]:
```
# second approach using loop

list1=[2,3,4,5,12.3,43.2]
total=1
for item in list1:
    total *=item
print(total)
```

```
63763.200000000004
```

11. What are the ways to find the length of a list

In [37]:
```
# first approach using built in function len()

list1=[2,3,4,5,"python",12.3,43.2,"data",[2,3]]
length=len(list1)
print(length)
```

```
9
```

In [25]:
```
# second approach using loop

list1=[2,3,4,5,"python",12.3,43.2,"data",[2,3]]
total=0
for item in list1:
    total +=1
print(total)
```

```
9
```

12. Python program to find the smallest and largest number in a list (Without min-max function)

In [26]:
```
list1=[2,3,4,5,12.3,43.2]

largest_num=-32567
smallest_num=32567

for num in list1:
    if num>largest_num:
        largest_num=num
for num in list1:
    if num < smallest_num:
        smallest_num =num

print(f"largest number is {largest_num}")
print(f"smallest number is {smallest_num}")
```

```
largest number is 43.2
smallest number is 2
```

In [27]:
```
list1=[2,3,4,5,12.3,43.2]
list1.sort()
print(f"largest number is {list1[-1]}")
print(f"smallest number is {list1[0]}")
```

```
largest number is 43.2
smallest number is 2
```

13. Python Program to find the area of a circle

In [8]:
```
radius=int(input())
area=3.14*radius**2
print(f"Area of circle is {area}")
```

```
3
Area of circle is 28.26
```

14. Take inputs from the user to make a list. Again take one input from the user and search it in the list and delete that element, if found. Iterate over a list using for loop.

In [16]:
```
list1=list(map(int,input().split()))
a=int(input())

for num in list1:
    if num==a:
        list1.remove(a)
print(list1)
```

```
1 2 3 4 5
3
[1, 2, 4, 5]
```

15. You are given a list of integer elements. Make a new list that will store a square of elements of the previous list. (With and without list comprehension) i. Input_list = [2,5,6,12] ii. Output_list = [4,25,36,144]

In [18]:
```
# without list comphrehension
list1=[2,5,6,12]
new_list=[]

for num in list1:
    new_list.append(num**2)
print(new_list)
```

```
[4, 25, 36, 144]
```

In [19]:
```
# with list comprehension
list1=[2,5,6,12]
new_list=[num**2 for num in list1]
print(new_list)
```

```
[4, 25, 36, 144]
```

16. WAP to create two lists, one containing all even numbers and the other containing all odd numbers between 0 to 151

In [27]:
```
even_list=[]
odd_list=[]

for i in range(152):
    if i%2==0:
        even_list.append(i)

    else:
        odd_list.append(i)

print(f"even list is {even_list}")
print(f"odd list is {odd_list}")
```

```
even list is [0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 3
4, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72,
74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 11
0, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 1
42, 144, 146, 148, 150]
odd list is [1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35,
37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75,
77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 1
13, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, 143,
145, 147, 149, 151]
```

17. Python program to Count Even and Odd numbers in a List

In [29]:
```
even_count=0
odd_count=0

for i in range(152):
    if i%2==0:
        even_count +=1

    else:
        odd_count+=1

print(f"even count is {even_count}")
print(f"odd count is {odd_count}")
```

```
even count is 76
odd count is 76
```

18. WAP to make new lists, containing only numbers which are divisible by 4, 6,8, 10, 3, 5, 7, and 9 in separate lists for range(0,151)

In [33]:
```
new_list=[]
for num in range(0,151):
    if num%2==0 or num%3==0 or num%5==0 or num%7==0:
        new_list.append(num)
print(new_list)
```

```
[0, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 15, 16, 18, 20, 21, 22, 24, 25, 26, 27,
28, 30, 32, 33, 34, 35, 36, 38, 39, 40, 42, 44, 45, 46, 48, 49, 50, 51, 52, 54,
55, 56, 57, 58, 60, 62, 63, 64, 65, 66, 68, 69, 70, 72, 74, 75, 76, 77, 78, 80,
81, 82, 84, 85, 86, 87, 88, 90, 91, 92, 93, 94, 95, 96, 98, 99, 100, 102, 104,
105, 106, 108, 110, 111, 112, 114, 115, 116, 117, 118, 119, 120, 122, 123, 124,
125, 126, 128, 129, 130, 132, 133, 134, 135, 136, 138, 140, 141, 142, 144, 145,
146, 147, 148, 150]
```

19. From a list containing ints, strings, and floats, make three lists to store them separately.

In [35]:
```
list1=[2,3,4,5,"python",12.3,54.2,"data"]
int_list=[]
float_list=[]
string_list=[]
for item in list1:
    if type(item)==int:
        int_list.append(item)

    elif type(item)==str:
        string_list.append(item)
    else:
        float_list.append(item)

print(f"integer list is {int_list}")
print(f"float list is {float_list}")
print(f"string list is {string_list}")
```

```
integer list is [2, 3, 4, 5]
float list is [12.3, 54.2]
string list is ['python', 'data']
```

20. What's The Difference Between The Python append() and extend() Methods?

In [ ]:
```
1) append() =>> This add the element to last of list one at a time
2) extend() =>> This will add anther list to the list at the end
```

21. Write a Python program to append a list to the second list

In [2]:
```
list1=[1,2,3,"python"]
list2=[9,7,6,"Data science"]

print(list1)
print(list2)
list1.append(list2)

print(f"after append list1 become {list1}")
```

```
[1, 2, 3, 'python']
[9, 7, 6, 'Data science']
after append list1 become [1, 2, 3, 'python', [9, 7, 6, 'Data science']]
```

22. Write a Python program to find the third-largest number in a list

In [6]:
```
list1=[1,2,3,4,5,67,45,69]

# third largest number is 45
first=0
second=0
third=0

for num in list1:
    if num>first:
        third=second
        second=first
        first=num

    elif num>second:
        third=second
        second=num

    elif num>third:
        third=num

print(f"largest number is {first}")
print(f"second largest number is {second}")
print(f"third largest number is {third}")
```

```
largest number is 69
second largest number is 67
third largest number is 45
```

In [37]:
```
list1=[1,2,3,4,5,67,45,69]
set1=set(list1)

list2=list(set1)
list2.sort()
print(list2)
print(f"third largest element is {list2[-3]}")
```

```
[1, 2, 3, 4, 5, 45, 67, 69]
third largest element is 45
```

23. Write a Python program to get the frequency of the elements in a list.

In [12]:
```
list1=[1,1,2,2,2,3,3,3,4,4,4,5,5,5]
for i in range(0,len(list1)):
    count=0
    for j in range(1,len(list1)):
        if list1[i]==list1[j]:
            count +=1
    else:
        print(f"{outer} is {inner} times")
```

```
13 is 13 times
13 is 13 times
13 is 13 times
13 is 13 times
13 is 13 times
13 is 13 times
13 is 13 times
13 is 13 times
13 is 13 times
13 is 13 times
13 is 13 times
13 is 13 times
13 is 13 times
13 is 13 times
13 is 13 times
```

24. Write a Python program to check whether a list contains a sublist

In [39]:
```
list1=[2,3,4,5,"python",12.3,54.2,"data",[2,3]]

for item in list1:
    if type(item)==list:
        print("a list contain a sublist")
        break
else:
        print("sublist is not present")
```

```
a list contain a sublist
```

25. Write a Python program to generate all sublists of a list

In [40]:
```
list1=[[1,2],3,4,5,6,[3,4],"python",[9,8]]
list2=[]

for item in list1:
    if type(item)==list:
        list2.append(item)
else:
    print(list2)
```

```
[[1, 2], [3, 4], [9, 8]]
```

26. Write a Python program to find common items from two lists

In [45]:
```
list1=[[1,2],3,4,5,6,[3,4],"python",[9,8]]
list2=[2,3,4,5,"python",12.3,54.2,"data",[2,3]]
list3=[]

for item1 in list1:
    for item2 in list2:
        if item1==item2:
            list3.append(item1)
else:
    print(list3)
```

```
[3, 4, 5, 'python']
```

In [49]:
```
l1 = [2,5,8,9,4,6]
l2 = [1,3,7,9,3,2]
for i in l1:
    for j in l2:
        if i == j:
            print("common item present in list is",i)
```

```
common item present in list is 2
common item present in list is 9
```

27. How to flatten a list in python?

In [51]:
```
list1=[1,2,3,4,[5,6],7,8,[9,10]]
list2=[]

for item in list1:
    if type(item)==list:
        list2.extend(item)
    else:
        list2.append(item)
else:
    print(list2)
```

```
[1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
```

28. How to sort a list in ascending and descending order without using the sort function?

In [55]:
```
list1=[2,5,3,7,4,8,5]
temp=0
for i in range(0,len(list1)-1):
    for j in range(i+1,len(list1)):
        if list1[i]>list1[j]:
            temp=list1[j]
            list1[j]=list1[i]
            list1[i]=temp
else:
    print(list1)
```

```
[2, 3, 4, 5, 5, 7, 8]
```

29. How to sort a tuple?

In [57]:
```
tup1=(2,5,3,7,4,8,5)
list1=list(tup1)
list1.sort()
tup2=tuple(list1)
print(tup2)
```

```
(2, 3, 4, 5, 5, 7, 8)
```

In [60]:
```
tup1=(2,5,3,7,4,8,5)
tup2=tuple(sorted(tup1))
print(tup2)
```

```
(2, 3, 4, 5, 5, 7, 8)
```

30. Write a Python program to convert a list of multiple integers into a single integer a. [11, 33, 50] >>> 113350

In [61]:
```
list1=[11,33,50]
for i in list1:
    print(i,end="")
```

```
113350
```

31. Difference between del and clear

del is the keyword which is used to delete the particular element from the list

clear function used to clear the all element from the list

32. Difference between remove and pop?

In [ ]:
```
remove(): it is used to remove the specific element from the list

pop(): it also used to delete element from the list.
       by default it will remove the last element from the list
```

33. Difference between indexing and Slicing?

In [ ]:
```
1) index() is used to find the index of the chartacter or element in the list

2)slicing is used to get the charater or word from the list
```

34. Difference between sort and sorted?

In [ ]:
```
1)sort(): this is used to sort the list by ascending or descending order

2)sorted is the inbuild function which will sort the list but not update it.
```

35. Difference between reverse and reversed?

In [ ]:
```
1)reverse(): this is used to reverse the list

2)reversed is the in build function which will reverse the list but not update i
```

36. Difference between copy and deep copy?

```
# 1)copy is also know as shallow copy which is used to copy the list into another list

2)deep copy is used whwn we have to copy the list which contain nested list in it.
```

37. How to check whether the list is empty or not?

In [ ]:
```
l1 = []
if len(l1) == 0 :
 print("list is empty")
else:
 print("list is not empty")
```

38. How to concatenate two lists?

In [ ]:
```
1) by using extend function we can concatenate the two list.

2) by using '+' operator also we can concatenate the two list but can update the list for updating need to assign new variable to it.
```

39. How to find the occurrences of an element in the python list?

In [1]:
```
# by using the for loop
l1 = [1,1,2,3,4,3,2,5,6]
for i in l1:
 print(f"the occurance of {i} is {l1.count(i)}")
```

```
the occurance of 1 is 2
the occurance of 1 is 2
the occurance of 2 is 2
the occurance of 3 is 2
the occurance of 4 is 1
the occurance of 3 is 2
the occurance of 2 is 2
the occurance of 5 is 1
the occurance of 6 is 1
```

40. How to flatten a list in python?

In [4]:
```
# the list can be flatten by converting the sub-list into single element of the l
l1 = [1,2,3,4,[5,6,7],8,9]
l2 = []
for i in l1:
    if type(i) == list:
        l2.extend(i)
    else:
        l2.append(i)
print(l2)
```

```
[1, 2, 3, 4, 5, 6, 7, 8, 9]
```

In [ ]:
```

```