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(4)

1) # len() function demo program

```
a = [25, 10.8, 'Hyd', True]
print (len(a))          # 4
b = []
print(len(b))           # 0
c = [[10, 20], 30, 40]
print (len(c))          # 3
```

2) # Sum ()

```
a = [25, 10.8, True]
print (sum(a))          # 36.8

b = [3+4j, 5+6j]
print (sum(b))          # 8+10j

c = [25, 10.8, True, 3+4j, False]
print (sum(c))          # (39.8+4j)

d = [10, 20, 15, 18]
print (sum(d))          # 63

e = [25, 10.8, 'Hyd', True]
print (sum(e))          # error cannot add string float &
                        #                              string
```

3) # find outputs

```
a = [[10, 20, 15, 18]]
print (sum(a))          # 1 only list inside list int & list
                        #                              not suppor
print (How to determine sum of inner list elements)
prf         print (sum (a[0]))
print ( How to determine sum of inner list elements in another
way)      total = 0
              for num in a[0]:
                   total += sum

                                              print (total)
```

4) max() and min()
```
a=[10,20,15,18,30,5,12]
print (max(a))          # 30
print (min(a))          # 5
b=['Rama', 'Sita', 'Rajesh', 'Kiran', 'Amar', 'Vamsi', 'Manohar']
print (max(b))          # "Vamsi"
print (min(b))          # "Amar"
c=[25, 10.8, 3+4j, True]
print(max(c)}
print (max(d))          # error cannot compare complex with int/floa
print (max([]))         # max() arg is an empty sequence
print (min ([]))        # min() arg is an empty sequence
d=[25, '35']            # mixing int & str is not comparisons
) list()
a=(10, 20, 15, 18)      # tuple
b= list(a)              # converts tupto to list -> [10, 20, 15, 18]
print (b)               # [10, 20, 15, 18]
print (type(b))         # list
print (a is b)          # a is tuple, b is list -> different object
                                                              -> Fal
print (a == b)          # Tuple & list element same but ≠ -> fals
```
5) find outputs
```
a= range (4, 10, 2)     # Number from 4 to 9 step =2 -> 4, 6, 8
b> list(a)              # [4, 6, 8] -> list
print (b)               # [4, 6, 8]
print (b) type(b))      # list
print
a= list('vamsi')        # string converted to list
print(a)                # ['v', 'a', 'm', 's', 'i']
a= list()
print (a)               # []
print (list (25))       # [] 
                        # error int object is not iterable
print (list (10))       #        float object is not iterable
```

```
print( list(True))     #Error 'bool' object ..
print ( list (None))   # Error 'None type object is not iterable
```

⑦ find outputs

```
a = ((10, 20) , (30, 40, 50), (60, 70, 80, 90))
print( list(a))    #[(10, 20), (30, 40, 50), (60, 70, 80, 90)]
b = { (10, 20) , (30, 40, 50), (60, 70, 80, 90)}
print( list (b))   # [(30, 40, 50), (10, 20), (60, 70, 80, 90)]
c = ([10, 20], (30, 40), { 50, 60})
print (list(c))    # [[10, 20, (30, 40), { 50, 60}]
```

⑧ sorted ( )

```
a = [10, 20, 15, 5, 12]
b = sorted (a)           # sorted and new list sorted in ascending
print (b)                #  [5, 10, 12, 15, 20]
print (type(b))          #  list
c = sorted (a, reverse = True)
print (c)                # [20, 15, 12, 10, 5]
print (a)                # [10, 20, 15, 5, 12]
```

⑨ find outputs

```
a = ['Rama', 'Rajesh', 'Amar', 'sita', 'vamsi', 'kiran', 'Rama Rao]
                                                              vamsi
b = sorted (a)           # ['Amar, 'Kiran', 'Rajesh', 'Rama Rao, 'sita'
print (b)
c = sorted (a, reverse = True) # Reverse order
print (c)                # ['vamsi', 'Sita', 'Rama Rao', 'Rajesh', 'kiran,
print (a)                # ['Rama', 'Rajesh', 'Amar', 'sita', 'vamsi', 'kira
                                                       'Rama Rao]
```

⑩ all() function

```
a = [12>10, 5<20, 30z==30]         #[True, True, True] -> True
print(all(a))

b = [9>=6, 12<=9, 6==6]            # [True, False, True] -> False
print(all(b))

d = [10, 0, 20]                    # [True, False, True] -> False
print(all(d))

e = []                             # all([]) -> True
print(all(e))                      # True
```

⑪ any() function

```
a = [12>18, 5<20, 35==30]          # [False, True, False] -> True
print(any(a))

b = [12>18, 25<20, 35==30]         # [False, False, False] -> False
print(any(b))

c = [0, 0.0, '', 25, 0+0j, False]  # [True] -> True
print(any(d))                      # all are false -> False

e = []                             # All are any([]) -> False since no
print(any(e))                      #                            True
```

⑫ #del operator

```
a = [10, 20, 15, 18]               # [10, 20, 15, 18]
print(a)                           # (10, 20, 15, 18]
del a[2]                           # Remove index 2 [3rd element = 15]
print(a)                           # [10, 20, 18]
del a[3]                           # Error -> list assigment index out of range
del a                              # Error occurs so these do not excute
print(a)
```

(13) append()

```
list = [10, 20, 15, 18]
print(list)                # [10, 20, 15 | 18]
list.append(19)            # append(x) add x to the end of the list
print(list)                # [10, 20, 15, 18, 19] -> New list
```

(14) Find outputs

```
list[]
print(list)                # []
                           # print(list) []
list.append(25)            # Add integer 25 to list -> [25].
list.append(10.8)          # add float to list -> [25, 10.8]
list.append('Hyd')         # add string to list -> [25, 10.8, 'Hyd']
list.append(True)          # add bool to list -> [25, 10.8, 'Hyd, True]
print(list)                # [25, 10.8, 'Hyd', True]
```

(15) find outputs

```
list = []
for x in range(0, 50, 10):  # range -> generate numbers starting 0
    list.append(x)          # up to but not including 50, with step of
    print(list)             # 10
                            # 50 -> 0, 10, 20, 30, 40
```

The for loop appends each number to list

```
1. start with []
2. Append 0 -> [0]
3. Append 10 -> [0, 10]
4. Append 20 -> [0, 10, 20]
5. Append 30 -> [0, 10, 20, 30]
6. Append 40 -> [0, 10, 20, 30, 40]
```

16) find outputs

```
a = [10, 20, 30]
a.append ('Hyd')       # adds 'Hyd' at the end of the list
print(a)               # list [10, 20, 30, 'Hyd']
print(len(a))          # 4
print (How to print 4th element of list 'a') # print(a[3])
print (How to print 'H') # print (a[3][0])
print ( How to print 'y') # print (a[3] (1))
print (How to print 'd') # print (a[3] (2))
```

) remove () method demo program

```
try:
    list = [10, 20, 15, 18, 15, 12, 15, 19]
    list.remove (15)    # removes first occurance of 15.
    print(list)         # [10, 20, 18, 15, 12, 15, 19]
    list.remove (25)    # 25 is not in list error
except:
    print ('25 is not in the list')
```

8) Write a program to delete 'all' occurences of 'x' from the list

```
1st = [10, 20, 15, 18, 19, 15, 17, 20, 15, 14]
x = 15
while x in 1st:
    1st.remove (x)
print(1st)
```

19) clear() method demo program

```
list = [10, 20, 15, 18]
print(list)              # [10, 20, 15, 18]
list.clear()            # remove all elements
print(list)             # []
```

20) reverse() method

```
a = [10, 20, 15, 18]
print(a)                 # [10, 20, 15, 18]
a.reverse()              # [18, 15, 20, 10]
print(a)                 # [18, 15, 20, 10]
```

21) sort() method program

```
list = [10, 20, 15, 18, 5]
print(list)              # [10, 20, 15, 18, 5]
list.sort()              # [5, 10, 15, 18, 20]
print(list)              # [5, 10, 15, 18, 20]
list.sort(reverse = True)
print(list)              # [20, 18, 15, 10, 5]
```

22) find outputs

```
a = ['Rama', 'Rajesh', 'Amar', 'Sita'. 'Vamsi', 'Kivan' 'Rama Rao]
print(a)     # ['Rama', 'Rajesh; Amar; 'sita'Vamsi', 'Kiran', 'RamaRao
a.sort()     # ['Amar', 'Kivan', 'Rajesh', 'Rama', 'Rama Rao', 'sita', Vam.
print(a)  ⟶
a.sort(reverse = True) #Evan
print(a)
             #['Vamsi', 'sita', Rama Rao', 'Rama', 'Rajesh', 'k
                                                         'Amar']
```

23) Identify error

```
a = [25, 10.8, 'Hyd', True]
a.sort()     # Type error 'x' not supported between c/ str
                                                    +100
```

24) count() method

```
a = [10, 20, 15, 18, 15, 12, 14, 15, 19]
print (a. count (15))        # 3
print (a. count (25))        # 25 is not present -> 0
print (len (a))              # 9
```

5) Tricky program

Write a program to remove all duplicate elements of list
(Not even single occurance)

Hint:-Use count() and append() methods

```
a = [10, 20, 15, 10, 14, 10, 18, 20, 19]
result = []
for x in a :
    if a.count (x) == 1:
        result.append (x)
print (result)
```

6) Write a program to determine all the list elements are in
the identical or not

```
a = [25, 25, 25, 25]
n = len(a)
count_first = a.count (a[0])
if count_first == n:
    print ("All the element are identical")
else :
    print ("All the element are not identical")
print (" How many element are in the list ? ---> ", n)     first
print (" How many times is first element repeated? --->", count_
```

(27) # index () method

a = [10, 20, 15, 12, 14, 15, 18, 19, 15, 12, 25]

```
try:
    i = a.index(15)          # 2
    while True:
        print(i)
        i = a.index(15, i+1)   # a.index(15, 6) ->finds 15 at 8 -> prints
except:
    print(F'15 is found {a.count(15)} times')   # 15 is found 3
                                                        times
```

a.index(15, 3) -> finds 15 at 5 -> prints 5