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- Chapter 10 - Exercises :

1. Can a Python list hold a mixture of integers and strings?

yes

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2. What happens if you attempt to access an element of a list using a negative index?

give value from last indext on list

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3. What Python statement produces a list containing the values 45, −3, 16 and 8, in that order?

lst = [45,-3,16,8] or lst=list(45,-3,16,8)

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4. Given the statementlst = [10, -4, 11, 29]

(a) What expression represents the very first element of lst? lst[0]

(b) What expression represents the very last element of lst? lst[-1] or lst [3]

(c) What is lst[0]? 0

(d) What is lst[3]? 29

(e) What is lst[1]? -4

(f) What is lst[-1]? 29

(g) What is lst[-4]? 10

(h) Is the expression lst[3.0] legal or illegal?

no its illegal and return eror

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5. Given the statementslst = [3, 0, 1, 5, 2]x=2 evaluate the followinge xpressions:

(a) lst[0]? 3

(b) lst[3]? 5

(c) lst[x]? 1

(d) lst[-x]? 1

(e) lst[x + 1]? 5

(f) lst[x] + 1? 2

(g) lst[lst[x]]? 0

(h) lst[lst[lst[x]]]? 3

---

6. What function returns the number of elements in a list?

len()

---

7. What expression represents the empty list?

lst=[] or lst=list()

---

8. Given the list

lst = [20, 1, -34, 40, -8, 60, 1, 3]

evaluate the following expressions:

(a) lst = [20,1,-34,40,-8,60,1,3]

(b) lst[0:3]= [20,1,-34]

(c) lst[4:8] = [-8,60,1,3]

(d) lst[4:33] = eror:out of range

(e) lst[-5:-3] = [40,-8]

(f) lst[-22:3] = eror: out of range

(g) lst[4:]= [-8,60,1,3]

(h) lst[:]= [20,1,-34,40,-8,60,1,3]

(i) lst[:4]= [20,1,-34,40]

(j) lst[1:5]= [1,-34,40,-8]

(k) -34 in lst= true

(l) -34 not in lst= false

(m) len(lst)= 8

An assignment statement containing the expression a[m:n] on the left side and a list on the rightside can modify list a. Complete the following table by supplying the m and n values in the sliceassignment statement needed to produce the indicated list from the given original list

Original List	Target List	Slice indices m	Slice indices n
[2, 4, 6, 8, 10]	[2, 4, 6, 8, 10, 12, 14, 16, 18, 20]		
[2, 4, 6, 8, 10]	[-10, -8, -6, -4, -2, 0, 2, 4, 6, 8, 10]		
[2, 4, 6, 8, 10]	[2, 3, 4, 5, 6, 7, 8, 10]		
[2, 4, 6, 8, 10]	[2, 4, 6, 'a', 'b', 'c', 8, 10]		
[2, 4, 6, 8, 10]	[2, 4, 6, 8, 10]		
[2, 4, 6, 8, 10]	[]		
[2, 4, 6, 8, 10]	[10, 8, 6, 4, 2]		
[2, 4, 6, 8, 10]	[2, 4, 6]		
[2, 4, 6, 8, 10]	[6, 8, 10]		
[2, 4, 6, 8, 10]	[2, 10]		
[2, 4, 6, 8, 10]	[4, 6, 8]		

---

10. Write the list represented by each of the following expressions.

(a) [8] * 4 = [8,8,8,8]

(b) 6 * [2, 7] = [2,7,2,7,2,7,2,7,2,7,2,7]

(c) [1, 2, 3] + ['a', 'b', 'c', 'd']= [1,2,3,'a', 'b', 'c', 'd]

(d) 3 * [1, 2] + [4, 2]= [1,2,1,2,1,2,4,2]

(e) 3 * ([1, 2] + [4, 2])= [1,2,4,2,1,2,4,2,1,2,4,2]

---

11. Write the list represented by each of the following list comprehension expressions.

(a) [x + 1 for x in [2, 4, 6, 8]]= [3, 5, 7, 9]

(b) [10*x for x in range(5, 10)]=

[50, 60, 70, 80, 90]

(c) [x for x in range(10, 21) if x % 3 == 0]=

[12, 15, 18]

(d) [(x, y) for x in range(3) for y in range(4)]=

[(0, 0), (0, 1), (0, 2), (0, 3), (1, 0), (1, 1), (1, 2), (1, 3), (2, 0), (2, 1), (2, 2), (2, 3)]

(e) [(x, y) for x in range(3) for y in range(4) if (x + y) % 2 == 0]=
[(0, 0), (0, 2), (1, 1), (1, 3), (2, 0), (2, 2)]

---

12. Provide a list comprehension expression for each of the following lists.

(a) [1, 4, 9, 16, 25]= [i*i for i in range(0,6)]

(b) [0.25, 0.5, 0.75, 1.0, 1.25. 1.5]= [i/4 for i in range (0,7)]

(c) [('a', 0), ('a', 1), ('a', 2), ('b', 0), ('b', 1), ('b', 2)]=

```
a = ["a","b"]
b = [0,1,2]
d = []
for i in a:
    for j in b:
        d+=[i,j]
```

---

13. If lst is a list, what expression indicates whether or not x is a member of lst?

x in lst

x not in lst

---

14. What does reversed do?

revrese evry vales in list mean u see list from back last member of list after reverse is first member

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15. Complete the following function that adds up all the positive values in a list of integers. For example,if list a contains the elements 3,−3,5,2,−1, and 2, the call sum_positive(a) would evaluate to 12,since 3+5+2+2 = 12. The function returns zero if the list is empty.Complete the following function that counts the even numbers in a list of integers. For example, if list a contains the elements 3,5,4,−1, and 0, the call count_evens(a) would evaluate to 2, since acontains two even numbers: 4 and 0. The function returns zero if the list is empty. The function doesnot affect the contents of the list.def count_evens(lst):

```
def sum_positive(lst:list=[])->list:
    """return a integer
    mean plus evry integer > 0  on list
    for exmaple [1,2,3,4,-4,-9]
    it will return = 10"""
    if not isinstance(lst,list):
        raise TypeError("worning!!input a list not other format")
    resault = 0
    for values in lst:
        if values>0:
            resault+=values
    if resault == 0 or len(lst)==0:
        return 0
    return resault
```

```
def count_evens(lst:list=[])-> int:
    """a function to catch a list
    and retuern count number % 2 = 0
    the fucntion return zero if list is empty
    """
    if not isinstance(lst,list):
        raise TypeError("worning!!input a list not other format")
    if len(lst)==0:
        return 0
    count=0
    for i in lst:
        if i % 2 == 0:
            count+=1
    return count
```

Add your code...

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17. Write a function named print_big_enough that accepts two parameters, a list of numbers and a number. The function should print, in order, all the elements in the list that are at least as large as thesecond parameter.

```
def print_big_enough(lst:list=[],number: int=0)-> int:
    """the list a retuen numbers bigger than seccend parameter
    and it will itrabble """
    if not isinstance(lst,list) or not isinstance(number,int):
        raise TypeError("worning!!!input a right values")
    for i in lst:
        if i > number:
            yield i
```

---

18. Write a function named next_number that accepts a list of integer values. All the elements in the list are unique, and all elements in the list are greater than or equal to one. (The caller must ensure that these

conditions are met before passing the list to next_number.)
Thenext_number function should return the smallest positive integer not in the list. (Note that 1 is the smallest positive integer.)

As examples,

- next_number([5, 3, 1]) would return 2
- next_number([5, 4, 1, 2]) would return 3
- next_number([2, 3]) would return 1
- next_number([]) would return 1

```
def next_number(lst:list[int]=[])->int:
    """acc a list of intger values
    evry elements will uniquie
    evrt elements will bigger than 1 or equal
    """
    nu_1 = True # to know in list we have number 1 or not
    for i in lst:
        if not isinstance(i,int) or i < 1:
            raise TypeError("worning!!!use integer on list and bigger than 1 ")
        if lst.count(i) == 2:
            raise ValueError("worning!!!your values is not uniquie")
        if i == 1:
            nu_1=True
    if nu_1 == False:
        return 1
    else:
        info_lst = lst.copy()
        info_lst.sort()
        for i in range(0,len(info_lst)+1):
            for j in range(0,len(info_lst)+1):
                i+=1
                if info_lst[i] > info_lst[j]+1:
                    return info_lst[j]+1
```

19. Write a function named reverse that reorders the contents of a list so they are reversed from their original order. a is a list. Note that your function must physically rearrange the elements within the list, not just print the elements in reverse order.

```
def revrese(lst: list=[])-> list:
    """
    a function catch a list
    than revrse the list
    return a list after reversed
    """
    temp = []
    if not isinstance(lst,list):
        raise TypeError("worning!!!input list please")
    for i in range (len(lst)-1,0-1,-1):
        temp.append(lst[i])
    return temp
```

---

20. Write a Python program that creates the matrix

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 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 1 1 1 1

and assigns it to the variable m. Pretty print m to ensure the contents are correct. Next, reassignm[2][4] to 0, and print m again to ensure your code modified the correct element.

```
def create_matrix(line:int=0,culomn:int=0)-> list:
    """a function to creat a matrix
    """
```

```
    temp=[]
    mtx=[]
    for li in range(0,line):
        for cu in range(0,culomn):
            print("[",li,"]","[",cu,"]","=",end="")
            temp+=(input())
        mtx+=[temp]
        temp=[]
    return mtx
l = int (input("input your line of matrix:"))
c = int(input("input your culomn matrix:"))
mx=create_matrix(l,c)
mx[2][4]=5555
```

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21. Provide five different ways to create the list [1, 2, 3, 4, 5, 6, 7, 8, 9, 10] and assign it tothe variable lst.

```
lst=[i for i in range(1,11)]
for i in range(0,10):
    lst.append(i+1)
for i in range(0,10):
    lst+=[i+1]
for i in range(0,10):
    lst.extend([i+1])
for i in range(0,10):
    lst.insert(i,i+1)
```

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22. In a square 2D list the number of rows equals the nnumber of columns. Write a function that acceptsa square 2D list and returns True if the left to right contents of any row equals the top to bottom matches any column, the function returns False.

```
def squere_2d(lst:list=[int])-> bool:
    """a function to return
```

```
    true or false
    true : if resaqul_line==resault_cloumn
    false: if resault_line!=resault_clumn
    """
    if len(lst)!=len(lst[0]):
        raise ValueError("input worning!!!need squere list -->cloumn and line is eqaul")
    temp_l=0
    temp_c=0
    for i in range(0,len(lst)):
        for j in range(0,len(lst)):
            temp_l+=lst[i][j]
            temp_c+=lst[j][i]
        if temp_c == temp_l:
            return True
        else:
            temp_l=0
            temp_c=0
    return False
ls=[[2,5,6],[3,7,9],[4,2,4]]
print(squere_2d(ls))
```

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23. We can represent a Tic-Tac-Toe board as a 3 × 3 grid in which each position can hold one of thefollowing three strings: "X", "O", or " ". Write a function named check_winner that accepts a3 × 3 list as a parameter. If "X" appears in a winning Tic-Tac-Toe pattern, the function should return

the string "X". If "O" appears in a winning Tic-Tac-Toe pattern, the function should return the string

"O". If no winning pattern exists, the function should return the string " ".

```
def cheack_winner(tic_tac: list=[["","",""],["","",""],["","",""]])-> str:
    """the funccti0on catch a list tic tac game
    and return winner or havent winner
    """
```

```
    temp_l=""
    temp_c=""
    temp_g=""
    temp_g_2=""
    for i in range(0,3):
        for j in range(0,3):
            temp_l+=tic_tac[i][j]
            temp_c+=tic_tac[j][i]
            if (i==0 and j==2)or(i==1 and j==1)or(i==2 and j==0):
                temp_g_2+=tic_tac[i][j]
            if i==j:
                temp_g+=tic_tac[i][j]
        if temp_l =="OOO" or temp_g == "OOO" or temp_g == "OOO" or temp_g_2=="OOO":
            return "O"
        elif temp_l=="XXX" or temp_g == "XXX" or temp_g == "XXX"or temp_g_2=="XXX":
            return "X"
        temp_l=""
        temp_c=""
    return"no winner"
l=[["X","O",""],
   ["O","X","O"],
   ["","O","X"]]
print(cheack_winner(l))
```

The End!