```
'''1. Write a Python program to create a list of size N and store the random values in it
and find the sum
 and average.'''

import random

def randomNumber(n):
    list= [random.randint(1, 100) for _ in range(n)]
    total=sum(list)
    avg=total/n if n>0 else 0
    print(list)
    print(avg)

n=int(input("Enter the size of the list: "))
randomNumber(n)
```

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''' 2. Define a function rotate that receives three arguments and returns a tuple in which
the first argument
 is at index 1, the second argument is at index 2 and the third argument is at index 0.
Define variables
 a, b and c containing 'Doug', 22 and 1984. Then call the function three times. For each
call, unpack
 its result into a, b and c, then display their values.'''

def rotate(a,b,c):
    return(c,b,a)
a,b,c=('Doug',22,1984)
print(rotate(a,b,c))
```

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''' 3. Design and develop a menu-driven Python program for the following list operations.
 a. Create a list of N integers
 b. Display the list elements
 c. Insert an element at a specific position
 d. Delete an element at a given position
 e. Exit'''
myList=[]
while(True):
    choice=input("Enter your choice: ")
    if choice=='a':
        myList=[int(i)
        for i in input("Enter elements of list: ").split()]
    elif choice=='b':
        print("List: ",myList)
    elif choice=='c':
        pos=int(input("Enter Position: "))
        ins=input("Enter you input: ")
        myList.append(pos,ins)
    elif choice=='d':
        dele=int(input("Enter index to delete: "))
        myList.remove(dele)
    else:
        break
```

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''' 4. Write a Python program that removes all occurrences of a specific element from a
list.'''


list=[1,3,3,4,5,6]
rem=int(input("Enter number you want to remove: "))
for i in range(len(list)):
    if i==rem:
        list.remove(rem)
print(list)
```

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''' 6. Input 10 integers from the keyboard into a list. The number to be searched is
entered through the
 keyboard by the user. Write a Python program to find if the number to be searched is
present in the
 list and if it is present, display the number of times it appears in the list.'''

list=[int(x) for x in input("Enter elements: ").split()]
search=int(input("Enter element to search: "))

count = list.count(search)
print(count)
```

```
''' 7. Write a function that takes a list of numbers as input from the user and produces
the corresponding
 cumulative list where each element in the list at index i is the sum of elements at index
j ≤ i.'''

def cum(n):
    cum=[]
    sum=0
    for i in n:
        sum+=i
        cum.append(sum)
    print(cum)
n = [int(x) for x in input("Enter elements: ").split()]
cum(n)
```

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'''  8.Write a function that takes n as an input and creates a list of n lists such that
ith list contains
the first five multiples of i.'''

def multiple(n):
    list=[]
    for i in range(1,n+1):
        for j in range(1,6):
            mul=i*j
            list.append(mul)
    print(list)

n=int(input("Enter a number: ")) multiple(n)
```

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'''10.Write a Python function that takes a tuple of tuples and prints the sum of all
numericel ements in the
 inner tuples.'''

def innerTuple(n):
    sumT=0
    for i in n:
        sumT+=sum(i)
    print(sumT)

n=((1,2),(3,4))
innerTuple(n)
```

```
'''11.Write a Python program to print M-by-N list in the tabular format'''

m=int(input("Enter M: "))
b=int(input("Enter N: "))
list=[]
for i in range(m):
    m = [int(x) for x in input(f"Enter row: ").split()]
    list.append(m)

print("Matrix:")
for m in list:
    print(*m)
```

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'''Q12: Sum of elements in each column of a 3-by-4 matrix.'''

matrix = []
for i in range(3):
    row = [float(x) for x in input("Enter row: ").split()]
    matrix.append(row)

print("Column sums:")
for col in range(4):
    col_sum = 0
    for row in matrix:
        col_sum += row[col]
    print(f"Column {col + 1}: {col_sum}")


'''Q14: Generate a tuple of squares of integers from 1 to 10.'''

def sqr():
    newTuple = tuple(i ** 2 for i in range(1, 11))
    print(newTuple)

sqr()
```

```
'''15.WriteaPythonprogramthatrandomlyfillsin0sand1sintoa4-by-4matrix,printsthematrix,and
 findsthefirstrowandcolumnwiththemost1s.Hereisasamplerunoftheprogram:
 0011
 0011
 1101
 1010
 Thelargestrowindex:2
 Thelargestcolumnindex:2
'''

import random
mat = [[random.randint(0, 1) for _ in range(4)] for _ in range(4)]

print("Matrix:")
for row in mat:
    print(''.join(map(str, row)))
r_max = max(range(4), key=lambda r: sum(mat[r]))
c_max = max(range(4), key=lambda c: sum(row[c] for row in mat))

print("Row with most 1s:", r_max)
print("Column with most 1s:", c_max)

'''
16.WriteaPythonprogramthatpromptstheusertoenteralistanddisplayswhetherthelistissortedor
 not.Hereisasamplerun.Notethatthefirstnumberintheinputindicatesthenumberofelementsin
 thelist.Thisnumberisnotpartofthelist.Hereisthesamplerun:
 Enterlist:8101516619111
 Thelistisnotsorted
 Enterlist:10113445791121
 Thelistisalreadysorted'''

def is_sorted(lst):
    return lst == sorted(lst)

nums = [int(x) for x in input("Enter numbers: ").split()]

print("Already sorted." if is_sorted(nums) else "Not sorted.")
```

```
'''Q17: Compute mean and standard deviation.'''

nums = [float(x) for x in input("Enter 10 numbers: ").split()]
mean = sum(nums) / len(nums)
std_dev = (sum((x - mean) ** 2 for x in nums) / (len(nums) - 1)) ** 0.5

print("Mean:", mean)
print("Standard Deviation:", std_dev)
```

```
'''Q18: Create a list with squares of all elements using list comprehension.'''

numbers = [int(x) for x in input("Enter numbers: ").split()]
squared_list = [x**2 for x in numbers]

print("Squared list:", squared_list)
```

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'''
 19.Write a Python function to demonstrate the difference between shallow and deepcopy of
 lists. For Example:
OriginalList: [[’Shallow’,2,3],[4,5,6]]
 ShallowCopy: [[’Shallow’,2,3],[4,5,6]]
 DeepCopy: [[1,2,3],[’Deep’,5,6]]
'''
import copy

original = [['Shallow', 2, 3], [4, 5, 6]]

shallow_copy = copy.copy(original)
deep_copy = copy.deepcopy(original)

# Modify the original
original[0][0] = 'Changed'

print("Original List:", original)
print("Shallow Copy:", shallow_copy)
print("Deep Copy:", deep_copy)
```

```
'''
 20. Twentystudentswereaskedtorateonascaleof1to5thequalityofthefoodinthestudentcafeteria,
 with1being“awful”and5being“excellent.”Placethe20responsesinalist.
 1,2,5,4,3,5,2,1,3,3,1,4,3,3,3,2,3,3,2,5
 Determineanddisplaythefrequencyofeachrating.Usethebuilt-in(oruser-defined)functionsand
 statisticsmodulefunctionstodisplaythefollowingresponsestatistics:minimum,maximum, range,
 mean,median,mode,varianceandstandarddeviation.
'''
from statistics import mean, median, mode, variance, stdev

responses = [1, 2, 5, 4, 3, 5, 2, 1, 3, 3, 1, 4, 3, 3, 3, 2, 3, 3, 2, 5]
frequency = {x: responses.count(x) for x in set(responses)}

print("Frequencies:", frequency)
print("Minimum:", min(responses))
print("Maximum:", max(responses))
print("Range:", max(responses) - min(responses))
print("Mean:", mean(responses))
print("Median:", median(responses))
print("Mode:", mode(responses))
print("Variance:", variance(responses))
print("Standard Deviation:", stdev(responses))
```

```
'''Q22: Reorder map and filter operations.'''

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

result = list(filter(lambda x: x % 2 == 0, map(lambda x: x * 2, numbers)))
print("Result:", result)

#Explanation: Applying map first results in even numbers being filtered from doubled
values.



''' 24. Given a list of tuples, remove all the tuples with length K, where K is user-
defined.'''
data = [(1, 2), (3, 4, 5), (6,)]
K = int(input("Enter the value of K: "))

filtered_data = [t for t in data if len(t) != K]
print("Filtered list:", filtered_data)
```