1.Write a program that calculates and prints the value according to the given formula:

Q = Square root of [(2 \* C \* D)/H]

Following are the fixed values of C and H:

C is 50. H is 30.

D is the variable whose values should be input to your program in a comma-separated sequence.

Example: Let us assume the following comma separated input sequence is given to the program:100,150,180

The output of the program should be: 18,22,24

from math import sqrt

def calculateProgram():

in\_num = eval(input("Enter the Input: "))

out\_num = []

C = 50 # Declaring and initializing constant C

H = 30 # Declaring and initializing constant H

for ele in in\_num:

Q = str(int(sqrt((2\*C\*ele)/H)))

out\_num.append(Q)

print("Output: {}".format(','.join(out\_num)))

calculateProgram()

Enter the Input: 100,150,180

Output: 18,22,24

2.Write a program which takes 2 digits, X,Y as input and generates a 2-dimensional array. The element value in the i-th row and j-th column of the array should be i\*j.

Note: i=0,1.., X-1; j=0,1,¡Y-1.

Example: Suppose the following inputs are given to the program: 3,5

Then, the output of the program should be:[[0, 0, 0, 0, 0], [0, 1, 2, 3, 4], [0, 2, 4, 6, 8]]

import array as arr

def generateArray():

in\_x = int(input('Enter the No of Rows:'))

in\_y = int(input('Enter the No of Columns:'))

out\_array = []

for ele in range(in\_x):

out\_array.insert(in\_x,[])

for sub\_ele in range(in\_y):

out\_array[ele].append(ele\*sub\_ele)

print(out\_array)

generateArray()

Enter the No of Rows:3

Enter the No of Columns:5

[[0, 0, 0, 0, 0], [0, 1, 2, 3, 4], [0, 2, 4, 6, 8]]

3.Write a program that accepts a comma separated sequence of words as input and prints the words in a comma-separated sequence after sorting them alphabetically ?

Suppose the following input is supplied to the program: without,hello,bag,world

Then, the output should be: bag,hello,without,world

def sortString():

in\_string = input("Enter the Input String: ")

out\_string = ','.join(sorted(in\_string.split(',')))

print(f'Output: {out\_string}')

sortString()

Enter the Input String: without,hello,bag,world

Output: bag,hello,without,world

4.Write a program that accepts a sequence of whitespace separated words as input and prints the words after removing all duplicate words and sorting them alphanumerically.

Suppose the following input is supplied to the program: hello world and practice makes perfect and hello world again

Then, the output should be: again and hello makes perfect practice world

def sortAlphaNumerically():

in\_string = input("Enter the Input String: ")

out\_string = ' '.join(sorted(sorted(list(set(in\_string.split(" "))))))

print(f'Output: {out\_string}')

sortAlphaNumerically()

Enter the Input String: hello world and practice makes perfect and hello world again

Output: again and hello makes perfect practice world

5.Write a program that accepts a sentence and calculate the number of letters and digits.

Suppose the following input is supplied to the program: hello world! 123

Then, the output should be:

LETTERS 10

DIGITS 3

def countLetterAndDigits():

in\_string = input("Enter the Input String: ")

lettersList = 'ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz'

digitsList = '0123456789'

letters = 0

digits = 0

for ele in in\_string:

if ele in lettersList:

letters += 1

if ele in digitsList:

digits += 1

print(f'LETTERS {letters} \nDIGITS {digits}')

countLetterAndDigits()

Enter the Input String: hello world! 123

LETTERS 10

DIGITS 3

6.A website requires the users to input username and password to register. Write a program to check the validity of password input by users.

Following are the criteria for checking the password:

At least 1 letter between [a-z]

At least 1 number between [0-9]

At least 1 letter between [A-Z]

At least 1 character from [$#@]

Minimum length of transaction password: 6

Maximum length of transaction password: 12

Your program should accept a sequence of comma separated passwords and will check them according to the above criteria. Passwords that match the criteria are to be printed, each separated by a comma.

Example:

If the following passwords are given as input to the program: ABd1234@1,a F1#,2w3E\*,2We3345

Then, the output of the program should be:ABd1234@1

def checkPassword():

in\_string = input("Enter the Input String: ")

small\_list = "abcdefghijklmnopqrstuvwxyz"

cap\_list = "ABCDEFGHIJKLMNOPQRSTUVWXYZ"

num\_list = "0123456789"

special\_list = "$#@"

for ele in in\_string.split(","):

if len(ele) <= 12 and len(ele) >=6 :

if any(i.isupper() for i in ele):

if any(i.islower() for i in ele):

if any(i for i in ele if i in special\_list):

print(ele)

checkPassword()

Enter the Input String: ABd1234@1,a F1#,2w3E\*,2We3345

ABd1234@1