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

A)

import math

def calculate\_formula(args):

c = 50

h = 30

result = []

for d in args:

result.append(int(math.sqrt((2\*c\*int(d))/h)))

print(result)

inp = list(input("Enter comma separated numbers input: ").split(','))

calculate\_formula(inp)

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.

A)

x = int(input("Enter X value: "))

y = int(input("Enter Y value: "))

matrix = []

for i in range(x):

row = []

for j in range(y):

row.append(i\*j)

matrix.append(row)

print(matrix)

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.

A)

wrd='without,hello,bag,world'

word=wrd.split(',')

sorted(word)

print(','.join(word))

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.

A)

words = list(set(input("Enter comma seperated words: ").split(' ')))

words.sort()

print(' '.join(words))

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

A)

words = input("Enter a sentence: ")

letters = 0

digits = 0

for c in words:

if (ord(c) >= ord('a') and ord(c) <= ord('z')) or (ord(c) >= ord('A') and ord(c) <= ord('Z')):

letters += 1

elif ord(c) >= ord('0') and ord(c) <= ord('9'):

digits += 1

print(letters)

print(digits)

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.

A)

def check\_smallcase(password):

check = False

for p in password:

if ord(p) >= ord('a') and ord(p) <= ord('z'):

check = True

break

return check

def check\_uppercase(password):

check = False

for p in password:

if ord(p) >= ord('A') and ord(p) <= ord('Z'):

check = True

break

return check

def check\_digit(password):

check = False

for p in password:

if ord(p) >= ord('1') and ord(p) <= ord('9'):

check = True

break

return check

def check\_specialchars(password):

check = False

specials = "!@#$%^&\*()\_+=->;,:/?`"

for p in password:

if p in specials:

check = True

break

return check

def check\_minlength(password):

return len(password) >= 6

def check\_maxlength(password):

return len(password) <= 12

passwords = list(set(input("Enter comma seperated passwords: ").split(',')))

valid\_passwords = []

for password in passwords:

if check\_smallcase(password) and check\_uppercase(password) and check\_digit(password) and check\_specialchars(password) and check\_minlength(password) and check\_maxlength(password):

valid\_passwords.append(password)

print(','.join(valid\_passwords))