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| --- | --- |
| Question 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()

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| --- | --- | --- | --- | --- | --- |
| Question 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()

Question 3:

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| --- | --- | --- | --- |
| 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()

Question 4:

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| --- | --- | --- | --- |
| 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()

Question 5:

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| --- | --- | --- | --- | --- |
| 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()

Question 6:

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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: | | | | | | | | | |
|  | | | | | | | | | |
| 1. At least 1 letter between [a-z] | |
|  | |
| 2. At least 1 number between [0-9] | | | | |
|  | | | | |
| 1. At least 1 letter between [A-Z] | | |
|  | | |
| 3. At least 1 character from [$#@] | | | |
|  | | | |
| 4. Minimum length of transaction password: 6 | | | | | | | |
|  | | | | | | | |
| 5. 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()