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| Question 1: |
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| Write a program that calculates and prints the value according to the given formula: |
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| Q = Square root of [(2 \* C \* D)/H] |
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| Following are the fixed values of C and H: |
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| C is 50. H is 30. |
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| D is the variable whose values should be input to your program in a comma-separated sequence. |
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| Example |
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| Let us assume the following comma separated input sequence is given to the program: |
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| 100,150,180 |
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| The output of the program should be: |
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18,22,24

Ans. 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. | |
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| Note: i=0,1.., X-1; j=0,1,¡­Y-1. |
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| Example |
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| Suppose the following inputs are given to the program: |
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| 3,5 |
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| Then, the output of the program should be: |
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| [[0, 0, 0, 0, 0], [0, 1, 2, 3, 4], [0, 2, 4, 6, 8]] |
|  |
| Ans. 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. |
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| Suppose the following input is supplied to the program: |
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| --- |
| without,hello,bag,world |
|  |

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

Ans. 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. |
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| Suppose the following input is supplied to the program: |
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| --- |
| hello world and practice makes perfect and hello world again |
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| Then, the output should be: |
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again and hello makes perfect practice world

Ans. 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. |
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| Suppose the following input is supplied to the program: |
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| --- |
| hello world! 123 |
|  |

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| --- |
| Then, the output should be: |
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|  |
| --- |
| LETTERS 10 |
|  |

DIGITS 3

Ans. 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. |
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| Following are the criteria for checking the password: |
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| 1. At least 1 letter between [a-z] |
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| --- |
| 2. At least 1 number between [0-9] |
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|  |
| --- |
| 1. At least 1 letter between [A-Z] |
|  |

|  |
| --- |
| 3. At least 1 character from [$#@] |
|  |

|  |
| --- |
| 4. Minimum length of transaction password: 6 |
|  |

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| --- |
| 5. Maximum length of transaction password: 12 |
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| 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. |
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| Example |
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| If the following passwords are given as input to the program: |
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| --- |
| ABd1234@1,a F1#,2w3E\*,2We3345 |
|  |

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

Ans. 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()