# Assignment 13

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

***Answer:***

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.

***Answer:***

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 ?

***Answer:***

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.

***Answer:***

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.

***Answer:***

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.

***Answer:***

Following are the criteria for checking the password:

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