**Python – Functions**

**Date: 16-07-2021**

**Note:** After completing the pending excercises continue the following exercise’s.

**Learning Topic:** Functions in python and its usage.

**Questions:**

Solve the following questions by using python functions.

1. Write a program that validates a password based on the following criteria:

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

lower, upper, special, digit = 0, 0, 0, 0

password = input("Enter the Strong Password:")

if (len(password) >= 8):

    for i in password:

        for word in password.split():

            if(word[0].isupper()):

                upper += 1

        if(i.islower()):

            lower += 1

        if(i.isdigit()):

            digit += 1

        if(i == '@' or i == '$' or i == '\_' or i == '#'):

            special += 1

else:

    print("Password should be more than 8 characters")

if (lower >= 1 and upper >= 1 and special >= 1 and digit >= 1):

    print("Valid Password")

else:

    print("Invalid Password")

output:

Enter the Strong Password:sanG34

Password should be more than 8 characters

Invalid Password

2. 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

string = input("Enter String value: ")

digit = 0

letter = 0

for char in string:

    if char.isdigit():

        digit = digit + 1

    elif char.isalpha():

        letter = letter + 1

print("Total Number of Letters : ", letter)

print("Total Number of Digits : ", digit)

# Output:

# Enter String value: Sangeet21

# Total Number of Letters :  7

# Total Number of Digits :  2

3. Given a string `s` of length `n` and number `k` where `n/k=0`,

divide the string into k fragments such that all characters in the given all fragments are unique.

Example:

input :

`s = aabdddddcghssas`

`k = 3`

output:

abd

dcg

hsa

def generate\_substr(s, k):

    if not s or k == 0:

        return None

    result = {}

    for i in range(len(s)):

        if len(s)-i <k:

            break

        if len(set(s[i:i+k]))==k:

            result[s[i:i + k]] = 1

    return result.keys()

print(generate\_substr('aabdddddcghssas',3))

#outpu:

# dict\_keys(['abd', 'dcg', 'cgh', 'ghs'])

4. Define a function which can print a dictionary where the keys are numbers between 1 and 20 (both included) and the values are square of keys.

Hints:

1.Use dict[key]=value pattern to put entry into a dictionary.

2.Use \*\* operator to get power of a number.

3.Use range() for loops.

def printDict():

    d=dict()

    for i in range(1,21):

        d[i]=i\*\*2

    print(d)

printDict()

# Output:

#{1: 1, 2: 4, 3: 9, 4: 16, 5: 25, 6: 36, 7: 49, 8: 64, 9: 81, 10: 100,

5. Write a program (function!) that takes a list and returns a new list that contains all the elements of the first list minus all the duplicates.

def remove\_dup\_set(input\_list):

    return list(set(input\_list))

a = input("Enter the list elements1:").split(" ")

print(remove\_dup\_set(a))

# output:

# Enter the list elements1:1 12 21 1 12 3 4 4 5 6 5

# ['5', '6', '1', '12', '21', '3', '4']

6. Take two lists, say for example these two:

a **=** [1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89]

b **=** [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13]

and write a program that returns a list that contains only the elements that are common between the lists (without duplicates). Make sure your program works on two lists of different sizes.

a = input("Enter the list elements1:").split(" ")

print(a)

b = input("Enter the list elements2:").split(" ")

print(b)

c=[]

for i in a:

    if i in b:

        c.append(i)

print(c)

# Output:

# Enter the list elements1:1 2 3 4

# ['1', '2', '3', '4']

# Enter the list elements2:2 23 43 1 3 6 7 9

# ['2', '23', '43', '1', '3', '6', '7', '9']

# ['1', '2', '3']

7. Write a program that takes a list of numbers (for example, a = [5, 10, 15, 20, 25]) and makes a new list of only the first and last elements of the given list. For practice, write this code inside a function.

a = input("Enter the list elements1:").split(" ")

def listend(x):

    return [x[0], x[-1]]

print(listend(a))

# output:

# Enter the list elements1:1 2 3 4 5 6 7

# ['1', '7']

8. Take a list, say for example this one:

a **=** [1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89]

and write a program that prints out all the elements of the list that are less than 5.

l=list(map(int,input("Enter the list elements:").split(" ")))

ele= int(input("Enter the number:"))

for i in range(0,len(l)):

    if(l[i]<ele):

        print(l[i],end=" ")

# Output:

# Enter the list elements:12 13 2 3 4 5

# Enter the number:5

# 2 3 4