**1. Define a class with a generator which can iterate the numbers, which are divisible by 7, between a given range 0 and n.**

class Task1:

    def gen(self, n):

        for i in range(n+1):

            if i%7 == 0:

                yield i

nums = Task1()

[i for i in nums.gen(100)]

[0, 7, 14, 21, 28, 35, 42, 49, 56, 63, 70, 77, 84, 91, 98]

**2. Write a program to compute the frequency of the words from the input. The output should output after sorting the key alphanumerically.**

def task2(string: str):

    string\_list = string.split(' ')

    out\_dict = {}

    for s in string\_list:

        if s in out\_dict.keys():

            out\_dict[s] += 1

        else:

            out\_dict[s] = 1

    for k, v in sorted(out\_dict.items()):

        print(k, ':', v)

task2('New to Python or choosing between Python 2 and Python 3? Read Python 2 or Python 3')

2 : 2

3 : 1

3? : 1

New : 1

Python : 5

Read : 1

and : 1

between : 1

choosing : 1

or : 2

to : 1

**3. Define a class Person and its two child classes: Male and Female. All classes have a method "getGender" which can print "Male" for Male class and "Female" for Female class.**

class Person:

    def getGender(self):

        pass

class Male(Person):

    def getGender(self):

        print('Male')

class Female(Person):

    def getGender(self):

        print('Female')

male = Male()

female= Female()

male.getGender()

female.getGender()

Male

Female

**4. Please write a program to generate all sentences where subject is in ["I", "You"] and verb is in ['Play', "Love"] and the object is in ["Hockey","Football"].**

subject=["I", "You"]

verb=["Play", "Love"]

obj=["Hockey","Football"]

sentence\_list = []

for i in subject:

    for j in verb:

        for k in obj:

            sentence\_list.append(i + " " + j + " " + k)

for sentence in sentence\_list:

    print(sentence)

I Play Hockey

I Play Football

I Love Hockey

I Love Football

You Play Hockey

You Play Football

You Love Hockey

You Love Football

**5. Please write a program to compress and decompress the string "hello world!hello world!hello world!hello world!"**

import zlib

string = 'hello world!hello world!hello world!hello world!'

compress\_string = zlib.compress(bytes(s, 'utf-8'))

print(f"Compressed string is: {compress\_string}")

print(f"Decompressed string is: {zlib.decompress(compress\_string)}")

Compressed string is: b'x\x9c\xcbH\xcd\xc9\xc9W(\xcf/\xcaIQ\xcc \x82\r\x00\xbd[\x11\xf5'

Decompressed string is: b'hello world!hello world!hello world!hello world!'

**6. Please write a binary search function which searches an item in a sorted list. The function should return the index of element to be searched in the list.**

def binarySearch(list1, n):

    low = 0

    high = len(list1) - 1

    mid = 0

    while low <= high:

        mid = (high + low) // 2

        if list1[mid] < n:

            low = mid + 1

        elif list1[mid] > n:

            high = mid - 1

        else:

            return mid

    return -1

sorted\_list = [1, 4, 5, 12, 54, 678, 1235]

binarySearch(sorted\_list, 54)

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