**Question 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 DivisibleBySeven:

def \_\_init\_\_(self, n):

self.n = n

def generator(self):

for i in range(0, self.n+1):

if i % 7 == 0:

yield i

div\_by\_seven = DivisibleBySeven(100)

for i in div\_by\_seven.generator():

print(i)

**Question 2:**

**Write a program to compute the frequency of the words from the input. The output**

**should output after sorting the key alphanumerically.**

**Suppose the following input is supplied to the program:**

**New to Python or choosing between Python 2 and Python 3? Read Python 2 or**

**Python 3.**

**Then, the output should be:**

**2:2**

**3.:1**

**3?:1**

**New:1**

**Python:5**

**Read:1**

**and:1**

**between:1**

**choosing:1**

**or:2**

**to:1**

def word\_frequency(sentence):

words = sentence.split()

word\_counts = {}

for word in words:

if word in word\_counts:

word\_counts[word] += 1

else:

word\_counts[word] = 1

sorted\_word\_counts = sorted(word\_counts.items(), key=lambda x: x[0])

for word, count in sorted\_word\_counts:

print(f"{word}:{count}")

sentence = "New to Python or choosing between Python 2 and Python 3? Read Python 2 or Python 3."

word\_frequency(sentence)

**Question 3:**

**Define a class Person and its two child classes: Male and Female. All classes have a**

**method &quot;getGender&quot; which can print &quot;Male&quot; for Male class and &quot;Female&quot; 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")

person = Male()

person.getGender() # Output: Male

person = Female()

person.getGender() # Output: Female

**Question 4:**

**Please write a program to generate all sentences where subject is in [&quot;I&quot;, &quot;You&quot;] and**

**verb is in [&quot;Play&quot;, &quot;Love&quot;] and the object is in [&quot;Hockey&quot;,&quot;Football&quot;].**

subjects = ["I", "You"]

verbs = ["Play", "Love"]

objects = ["Hockey", "Football"]

for subject in subjects:

for verb in verbs:

for obj in objects:

print(f"{subject} {verb} {obj}.")

**Question 5:**

**Please write a program to compress and decompress the string &quot;hello world!hello**

**world!hello world!hello world!&quot;.**

import zlib

def compress(string):

compressed = zlib.compress(string.encode())

return compressed

def decompress(compressed):

decompressed = zlib.decompress(compressed).decode()

return decompressed

string = "hello world!hello world!hello world!hello world!"

compressed = compress(string)

decompressed = decompress(compressed)

print(f"Original string: {string}")

print(f"Compressed string: {compressed}")

print(f"Decompressed string: {decompressed}")

**Question 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 binary\_search(arr, x):

low = 0

high = len(arr) - 1

while low <= high:

mid = (low + high) // 2

if arr[mid] == x:

return mid

elif arr[mid] < x:

low = mid + 1

else:

high = mid - 1

return -1

arr = [1, 2, 3, 4, 5, 6, 7, 8, 9]

x = 5

result = binary\_search(arr, x)

if result != -1:

print(f"Element is present at index {result}")

else:

print("Element is not present in array")