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

In [3]:
```
def generator_class(n):
    i = 0
    while i<n:
        j=i
        i=i+1
        if j%7==0:
            yield j

for i in generator_class(100):
    print(i)
```

```
0
7
14
21
28
35
42
49
56
63
70
77
84
91
98
```

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

In [13]:
```
def frequency(input):
    freq = {}

    for word in input.split():
        freq[word] = freq.get(word, 0) + 1

    words = list(freq.keys())
    words.sort()

    for w in words:
        print(f'{w}:{freq[w]}')

input = "nishit call his as well as him not nishit nishit call "
frequency(input)
```

```
as:2
call:2
him:1
his:1
nishit:3
not:1
well:1
```

1. 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.

In [17]:
```
class Person(object):
    def __init__(self):
        self.gender = "unknown"

    def know_Gender(self):
        print(self.gender)

class Male(Person):
    def __init__(self):
        self.gender = "Male"

class Female(Person):
    def __init__(self):
        self.gender = "Female"

shreya = Female()
nishit = Male()
shreya.know_Gender()
nishit.know_Gender()
```

```
Female
Male
```

1. 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"].

In [22]:
```
subjects=["I", "You"]
verbs=["Play", "Love"]
objects=["Hockey","Football"]
for i in range(len(subjects)):
    for j in range(len(verbs)):
        for k in range(len(objects)):
            sentence = "%s %s %s." % (subjects[i], verbs[j], objects[k])
            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.
```

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

In [23]:
```
import zlib
s = 'hello world!hello world!hello world!hello world!'.encode()
t = zlib.compress(s)
print("compressed = ",t)
r=zlib.decompress(t)
print("decompressed = ",r)
```

```
compressed =  b'x\x9c\xcbH\xcd\xc9\xc9W(\xcf/\xcaIQ\xcc \x82\r\x00\xbd[\x11\xf5'
decompressed =  b'hello world!hello world!hello world!hello world!'
```

1. 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.

In [29]:
```
import math
def binary_search(li, element):
    bottom = 0
    top = len(li)-1
    index = -1
    while top>=bottom and index==-1:
        mid = int(math.floor((top+bottom)/2.0))
        if li[mid]==element:
            index = mid
        elif li[mid]>element:
            top = mid-1
        else:
            bottom = mid+1

    return index

li=[1,54,11,56,12,56]
print(binary_search(li,11))
print(binary_search(li,12))
```

```
2
4
```