Challenge 1

Program to get the nth number in the fibonacci sequence given n

In [1]:

```
# first,second,third are the first three numbers of fibonacci series
first = 0
second = 1
third = first + second

n = 0 # limit of the fibonacci sequence
vals = {} # The fibonacci seguence will be stored in a dictionary
```

In [2]:

```
# prompting user to enter limit of the fibonacci sequence
n = int(input("Enter limit "))
```

```
Enter limit 10
```

In [3]:

```
while n > 0:
   for i in range(1,n+1):
    vals[i] = first
    n = n -1
    if n == 0:
        break
    first = second
    second = third
    third = first + second
```

In [4]:

```
print("The fibonacci series is ")
for key,value in vals.items():
      print(value)
```

```
The fibonacci series is
0
1
1
2
3
5
8
13
21
34
```

In [5]:

```
print(f'The entered limit was {len(vals)}')
print(f'The {len(vals) }th number in sequence is',first)
```

```
The entered limit was 10
The 10th number in sequence is 34
```

Given a number F, print out whether it's a fibonacci number and what the closest index n in the fibonacci sequence is.

In [6]:

```
# Prompting user to enter a number
num =int(input("Enter a number:  "))
```

```
Enter a number:  1111
```

In [7]:

```
# f1,f2,f3 are the first three numbers
f1 = 0
f2 = 1
f3 = f1 + f2

# flag is used to indicate if number is fibonacci or not
flag = 0

# fibonacci number stored in dictonary val with index i
val = {}
i = 1

#Loop to be executed till the entered number is greater than the last number in fibo
while num >= f1:
    val[i] = f1
    i = i + 1
    if(num == f1):# if the entered number is equal to number in fibonacci series the
        flag = 1
        break
    else:
        f1 = f2
        f2 = f3
        f3 = f1 + f2

if flag == 1:
    print("The entered number is fibonacci and at index ",len(val))
else:
    print("The number is not fibonacci")

    val[len(val)+1]=val[len(val)]+val[len(val)-1] # adding the last element of fibon
    # The closest number/index is a number whose difference with the entered number
    previous_num = val[len(val)-1]
    next_num = val[len(val)]
    if((num-previous_num)<(next_num-num)):
         print("The closest index is at",(len(val)-1))
    else:
         print("The closest index is at",len(val))
```

```
The number is not fibonacci
The closest index is at 17
```

In [8]:

```
print("The Fibonacci series ")
val
```

```
The Fibonacci series
```

Out[8]:

```
{1: 0,
 2: 1,
 3: 1,
 4: 2,
 5: 3,
 6: 5,
 7: 8,
 8: 13,
 9: 21,
 10: 34,
 11: 55,
 12: 89,
 13: 144,
 14: 233,
 15: 377,
 16: 610,
 17: 987,
 18: 1597}
```